SPECIAL REPORT

Forecast 2008

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TRENDS FOR '08

OUR VITAL SIGNS SURVEY FORECASTS A BUSY YEAR FILLED WITH INTRICATE PROJECTS, NEW STAFF AND A CRUSHING AMOUNT OF DATA. **ARE YOU READY?**

JANUARY 1, 2008 VOL. 42, NO. 1 $5/COPY

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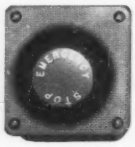
Inside

COMPUTERWORLD ■ JANUARY 1, 2008

■ NEWS DIGEST

4 Microsoft acknowledges that a patch **crippled** Internet Explorer for some users. | SPEC releases a **benchmark test suite** designed to help IT managers compare servers on the basis of **energy efficiency**.



6 E-voting systems in Ohio are found to have serious **security shortcomings**. | A systems administrator faces up to **five years in prison** for shutting down the data center that controls California's electrical grid.

8 A car parts catalog publisher uses **open-source tools** to ease **data integration**. | Opera Software **files a complaint** in Europe to try to force Microsoft to **unbundle IE** from Windows.

■ OPINION

2 Editor's Note: **Don Tennant** knows he's no Nostradamus, so he figures he's better off predicting what *won't* happen in IT in 2008 rather than what will happen.

36 Frankly Speaking: **Frank Hayes** looks at some hot-button issues to watch out for this year: security, users who can't be stopped and baby boomer brain drain.

Online AT COMPUTERWORLD.COM

» 8 JUICY PREDICTIONS FOR 2008

Industry pundits present eight things you ought to prepare for in 2008, from working in a fishbowl to battling internal political strife.

» TOP PERSONAL TECH TRENDS FOR 2008

Once you've read *Computerworld*'s look at the top eight trends for corporate IT, visit our Web site to read about the personal technology trends that will make news in the coming year. *Computerworld* contributing writer and mobile tech expert Mike Elgan makes his predictions.

SPECIAL REPORT FORECAST 2008

8 TRENDS FOR '08

These eight trends for the new year, identified in our latest Vital Signs survey, run the gamut from lukewarm budgets to white-hot talent searches to data boiling over. Not much in life is certain, but here's what you can count on: It will be a busy year filled with intricate projects, new staff and a crushing amount of data.

TREND NO. 1

10 Tightfisted Budgets Loosen a Bit

IT executives like Animas CTO Bogdan Butoi-Teodorescu (above) expect some relief from years of austerity, yet the economy continues to cast a shadow of uncertainty over the best-laid tech spending plans.

TREND NO. 2

16 Projects Get More Troublesome

Project management is a mounting headache for IT managers, thanks to increasing globalization, IT budget swings, an overall increase in the complexity of projects and end users who are simply demanding more.

TREND NO. 3

18 Servers Go Front and Center

As organizations consolidate their systems and prepare for new versions of key software, such as Windows Server 2008, major server-related projects are getting put on the front burner.

TREND NO. 4

20 Storage Projects Rise in Importance

The profusion of large files and even virtualization technology is driving data overload and forcing corporate IT leaders to find new ways to centralize storage.

TREND NO. 5

22 Face-off: Virtualization Takes Center Stage

Frank Hayes (right) draws the ire of Mark Hall when he declares 2008 the Year of Virtualization.

TREND NO. 6

26 Hiring Ticks Up Again

As more projects get green-lighted, IT isn't just adding bodies; rather, it's looking for people with key skills to help drive specific business goals and objectives.

TREND NO. 7

28 A Skills Shortage Simmers

CIOs and other hiring managers will continue to struggle to recruit and retain IT workers, putting upward pressure on compensation for hot skills.

TREND NO. 8

30 Google Speeds Up Expansion

Google watchers offer bold predictions on the company's next moves.

COVER ILLUSTRATIONS BY RICHARD BORGE

Alternative Thinking About Server Rooms:

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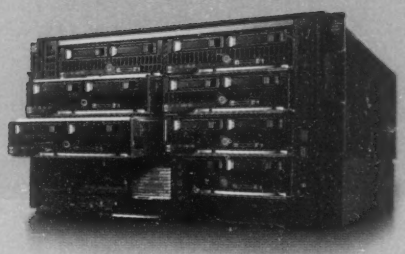

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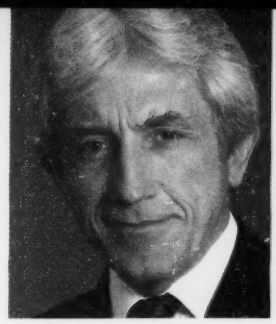
■ EDITOR'S NOTE

Don Tennant

No Nostradamus



IT'S REMARKABLE how much Nostradamus and I have in common. We both entered the University of Avignon at the age of 15. We both served as royal physicians to French monarchs. And, of course, we've shared, in our respective eras, the uncanny ability to predict future events.

OK, that's not entirely true. In fact, it's entirely absurd, as is the notion of me trying to predict what the new year will bring in the realm of information technology. I know I'm supposed to have some inclination to do that, but I simply have no clue what's going to happen, so I wouldn't even know where to begin. It's for that reason that I present instead my third annual list of things that will *not* happen in the coming year. You can take these to the bank.

■ Apple will not be airing its clever Mac/PC commercial with the security theme in 2008. Remember that one? The staid PC nerd tells the cool Mac dude that "PCs have a lot of security problems," so he has to communicate through the Vista security guy in dark glasses, who does the "Cancel or allow?" thing. Given that Apple had to patch about 200 bugs in its Mac operating system by means of nine security updates in 2007 alone — including a patch it had to issue last month to fix 41 flaws — Apple would look more ridiculous than the PC nerd ever did if it ran the ad again.

■ Even though it's being held in Las Vegas, the Gartner Symposium/ITXpo 2008 coming up in April will not feature scantily-clad women.

You may recall that one of the exhibitors at Gartner's October event went the inappropriately-attired booth-babe route to draw attention, which it certainly did. It also drew the ire of a lot of our readers, and of SIM Women, an affiliate of the Society for Information Management. If a stunt like that is pulled again, what happens in Las Vegas certainly won't stay in Las Vegas, and Gartner knows it. You'll see female booth attendants in Hillary Clinton pantsuits before you'll see them in bimbowear.

■ At the Gartner event, you'll see female booth attendants in Hillary Clinton pantsuits before you'll see them in bimbowear.

■ In 2008, AMD will not overlook the importance of paying really close attention to the accuracy of the information posted on its Web site, as it did in 2007.

A United Arab Emirates company that AMD listed on its site as an authorized distributor last month was identified by *Computerworld* as a possible technology provider for an Iranian research outfit that illicitly obtained Opteron processors to build a supercomputer. The person whose job it was to keep the authorized distributor list updated probably had a bad day shortly thereafter, because AMD said it had terminated its agreement with the UAE distributor in July but had failed to update the list. (Of course, it would seem that the Iranians had to have obtained the processors long before July in order to have built a supercomputer by December, but let's not quibble.) The last thing AMD needs is the perception that it or its partners are doing anything fishy in the Middle East, especially in light of the fact that it recently accepted $622 million in funding from a UAE investment firm. Intel couldn't have hoped for a better holiday gift.

■ Charles Wang, the founder and former CEO of Computer Associates (the company that had to change its name to CA in order to distance itself from Wang's legacy) will not lose any sleep in 2008 over the fact that his successor and protégé, Sanjay Kumar, is languishing in a New Jersey prison. If he had a conscience, he wouldn't have let Kumar take the rap in the first place, since it was Wang who recklessly instilled misconduct into CA's culture from the company's inception.

With this year's list duly presented, let me invite you to enjoy our Forecast 2008 coverage, beginning on page 10. That's where the real insights lie. And on behalf of all of us at *Computerworld*, let me wish you a happy, healthy, rewarding new year. ■

Don Tennant *is editorial director of* Computerworld *and* InfoWorld. *Contact him at don_tennant@computerworld.com, and visit his blog at* http://blogs.computerworld.com/tennant.

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News Digest

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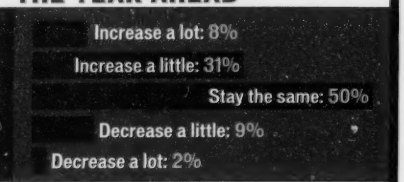
THE YEAR AHEAD

IT decision-makers were recently asked how their budgets will change over the next six months.



SOURCE: A SURVEY OF 1,072 TECHNOLOGY USERS BY CDW CORP.

FOR MORE FORWARD-LOOKING DATA, SEE OUR FORECAST 2008 SPECIAL REPORT STARTING ON PAGE 10.

INTERNET

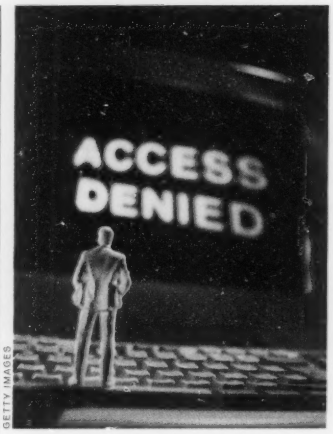
Microsoft Patch Puts Up Stop Sign For Some IE Users

MICROSOFT CORP. acknowledged on Dec. 18 that a software patch issued earlier in the month for Internet Explorer had crippled the Web browser for some users.

After initially suggesting a work-around that required changes to the Windows registry on PCs, the company released an automated fix for the problem. But it didn't reissue the patch with the fix included.

Kieron Shorrock, IE program manager at the Microsoft Security Response Center (MSRC), said the problem affects IE6 users whose PCs are running Windows XP with the Service Pack 2 update installed. On such systems, the browser "may stop responding when you try to a visit a Web site," Shorrock said.

But Shorrock downplayed the problem in a posting on the MSRC's blog. He wrote there that the bug occurred only in what he described as "a customized installation" and that just "a small number of customers" had reported having problems after deploying the patch.



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Despite those soothing words, the snafu generated a buzz on some Microsoft support newsgroups. Almost immediately after the patch was issued on Dec. 11 as part of Microsoft's monthly release of software updates, users began posting messages saying that their browsers couldn't reach Web sites or wouldn't open at all.

Harold Decker, operations manager at Gold Peak Industries NA Inc. in San Diego, said he started fielding calls from IE users first thing in the morning after Microsoft released the patch. After five of the first 13 users who deployed the patch encountered problems with IE, Decker, who manages 35 PCs running Windows XP SP2, stopped everyone else from installing the update.

The registry-edit work-around that Microsoft at first suggested didn't placate some users. One, identified only as "Phil," asked whether the suggestion was a joke, in a comment attached to a posting by another Microsoft official on the vendor's IE blog.

"With hundreds of users here running XP SP2 with IE6," Phil wrote, "how can Microsoft be serious that the solution is to edit each registry? It would be easier to have each user install Mozilla Firefox and stop using IE completely."

Decker applauded Microsoft's subsequent release of the automated fix, which can be downloaded manually or installed via Windows Update. But he added that Microsoft should take the next step and reissue the entire IE patch.

— Gregg Keizer

SERVERS

Green Server Benchmark Takes Root

STANDARD PERFORMANCE Evaluation Corp. (SPEC), which creates performance benchmarks for servers, has released a test suite that is designed to let server buyers comparison-shop on the basis of energy efficiency.

Five server vendors helped develop the new benchmark, as did Intel Corp. and Advanced Micro Devices Inc.

A similar initiative is under way at the U.S. Environmental Protection Agency, which is creating a version of its Energy Star rating for servers. Klaus-Dieter Lange, a senior performance engineer at Hewlett-Packard Co. who heads the SPEC subcommittee that developed the benchmark, said he thinks the EPA "will adapt what we came up with."

SPEC's benchmark covers only one kind of server workload now. Even so, "having real, measured data is a vast step forward," said Jonathan Koomey, a staff scientist at Lawrence Berkeley National Laboratory and an adviser to the EPA.

– PATRICK THIBODEAU

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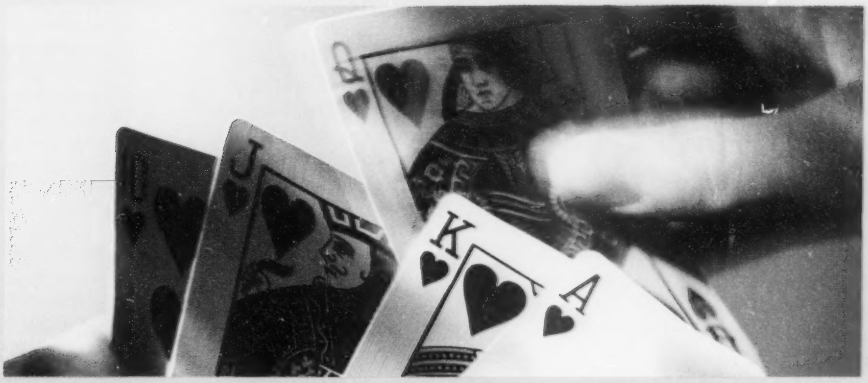

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IT IN GOVERNMENT

Tests in Ohio Point to E-voting Insecurities

A SERIES OF tests on the electronic voting systems used in Ohio showed that security shortcomings are a continuing danger to the accuracy of elections there, according to a report released in December by Ohio Secretary of State Jennifer Brunner.

The report recommended a series of steps designed to mitigate those threats, including centralizing the counting of electronic votes and shifting away from the use of touch-screen voting systems.

Brunner had requested the risk assessment tests, which were conducted by two testing firms that worked along with teams of academic researchers from three universities. Her report described the results of the tests as "disturbing."

"These findings do not lend themselves to sustained or increased confidence in Ohio's voting systems," Brunner wrote. She noted that the e-voting machines "do not meet computer industry security standards and are susceptible to breaches of security that may jeopardize the integrity of the voting process."

A spokesman for Brunner said that the recommendations made in the report "are in no way set in stone. They're being put out there to contemplate."

Security Fixes

The e-voting security report recommends these changes in Ohio:

- Centralizing the counting of e-votes to reduce the number of potential system-entry points for intruders.
- Barring touch-screen technology and mandating that all e-voting systems be optical-scan machines.
- Requiring counties with touch-screen systems to offer paper ballots to voters in the March 4 presidential primary.

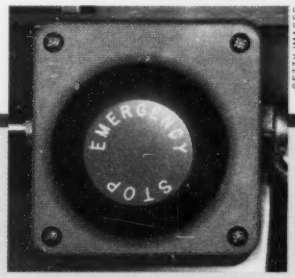
The vendors whose systems were tested include Election Systems & Software Inc., Hart InterCivic Inc. and Premier Election Solutions Inc., which was formerly called Diebold Election Systems Inc.

The three vendors didn't dispute the need for such tests but defended their systems. For example, a spokesman for Hart InterCivic said tests often evaluate e-voting systems that have been certified in previous years and are then criticized for not meeting new security requirements.

But Avi Rubin, a computer science professor at Johns Hopkins University who heads the e-voting activist group ACCURATE, said Ohio's security problems "are so serious that it's no surprise they're trying to get away from [touch-screen] machines as quickly as possible."

"I don't think it's impossible to build high-tech voting systems," he said. "But it will require a lot more quality control and effort than we've seen so far."

— Todd R. Weiss



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Short Takes

■ Apple Inc. has issued a year-end flurry of fixes for its Mac OS X operating system and the test version of its Safari browser. The 31 OS X updates affect several components. The Safari patch fixes a scripting security problem that affects Windows users.

■ Microsoft Corp. has signed an agreement with the Protocol Freedom Information Foundation that will give developers of open-source Samba software access to previously secret Windows protocol specifications. The foundation will pay a $20,000 fee so open-source developers can access the code.

■ James Whitehurst, former chief operating officer at Delta Air Lines Inc., has been named CEO of Red Hat Inc. Whitehurst replaced Matthew Szulik, who said he resigned the post after eight years due to family health issues.

■ Intel Corp.'s venture-capital arm has invested an undisclosed sum in Nirvanix Inc., a San Diego start-up developer of scalable online storage service.

DATA CENTERS

Sysadmin Admits to Hitting 'Off' Button at Data Center

A SYSTEMS ADMINISTRATOR who worked at the data center that controls California's power grid pleaded guilty in December to federal charges that he maliciously shut down the facility after his computer privileges were revoked.

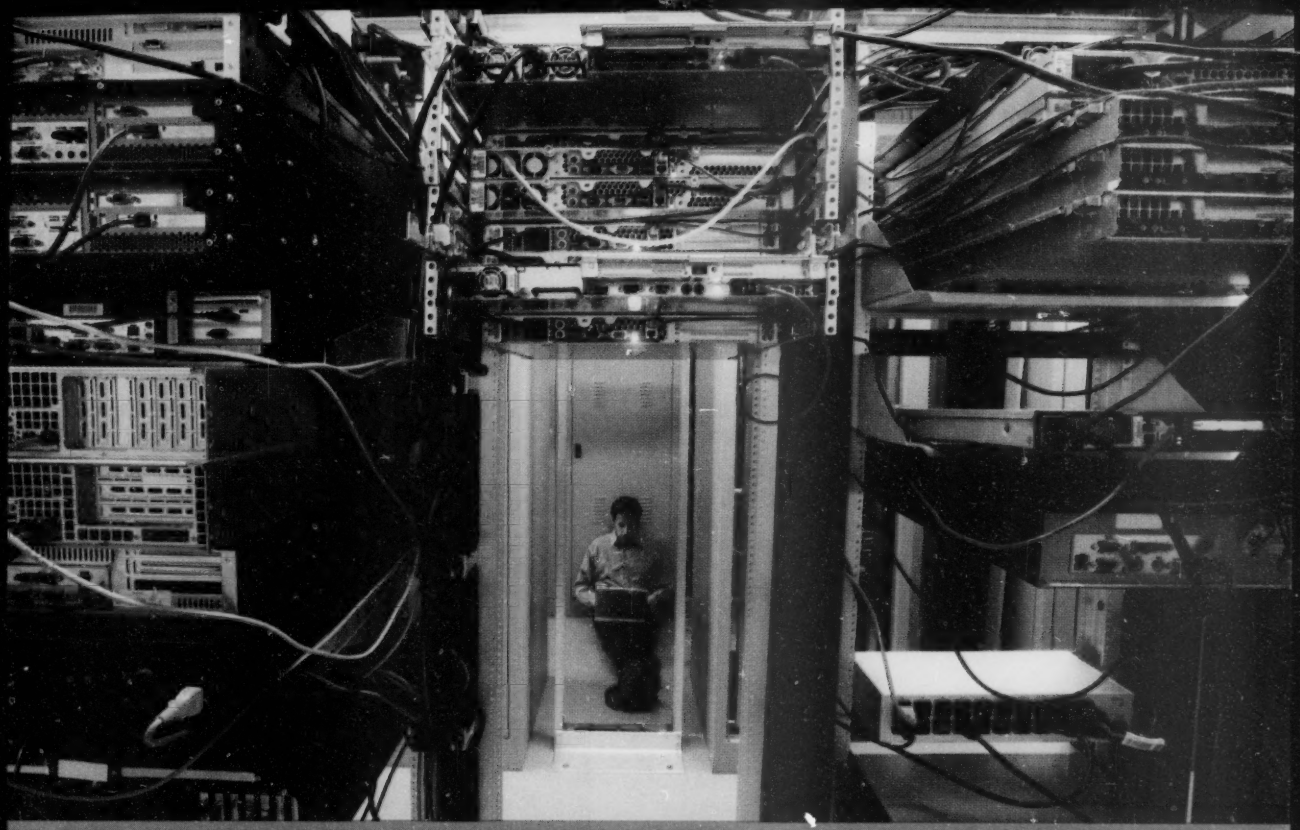
Lonnie Charles Denison, 33, faces up to five years in prison and a $250,000 fine after admitting that he broke a glass cover and hit an emergency "off" button at the California Independent System Operator's data center in Folsom last April 15. By doing so, Denison cut off California from the wholesale electricity market.

That left the state vulnerable to blackouts, although none occurred – partly because the data center went offline at 11:23 p.m. on a Sunday. The facility was down for about two hours, and it took seven hours for a team of 20 computer technicians to fully restore the systems there.

Denison had been managing Unix systems as a contractor for Science Applications International Corp. But according to federal prosecutors, he had a dispute with his boss at SAIC and learned just minutes before causing the shutdown that he had lost computer access rights.

The prosecutors also alleged that the next day, Denison e-mailed a bomb threat to a California ISO employee. That prompted the ISO to evacuate about 500 employees from three buildings in Folsom and transfer control of the power grid to another data center.

– ROBERT McMILLAN, IDG NEWS SERVICE



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DATABASES

ETAI Rides Open Source To Ease Data Traffic Jam

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ETAI Group publishes parts catalogs and service manuals for about 85% of the automobiles built in Europe over the past 15 years. But with 50,000 car models and a million parts to keep track of in nine massive databases, its homegrown data-integration system wasn't running on all cylinders anymore.

The databases, which include information about different types of parts, are written in various programming languages and have dissimilar data fields. Updating and integrating the data stored in them required 15 steps and took two to three weeks, said Philippe Bobo, director of software and information systems at ETAI, which is based outside of Paris.

That was a big problem, he added, because ETAI's catalogs and manuals have to be updated about 100 times each year to add information about new vehicles.

In an attempt to streamline the process, ETAI last March began using open-source data-integration tools developed by Talend Inc. in Los Altos, Calif. Bobo said that when the project is completed, he expects to be able to "press a button on Monday and get the finished database on Wednesday."

ETAI has tied together a majority of its databases using Talend's Open Studio tools and expects to finish the work by the end of 2008, Bobo said. But, he added, the project is running about three months behind schedule.

"It is more difficult than we expected," Bobo said, citing internal resource and software documentation issues. In addition, ETAI has had problems setting up some of the new process-automation tasks, he said.

— Todd R. Weiss

BETWEEN THE LINES *By John Klossner*

BENCHMARKS

Sprint Nextel Corp. named Daniel Hesse president and CEO, two months after predecessor Gary Forsee resigned. Hesse had been CEO at Embarq Corp. since that company was spun off by Sprint in May 2006.

IDC said that in 2007's third quarter, the growth of laptop PC sales outpaced desktop sales growth by 33 percentage points – the first time that the gap has been more than 30 points.

ONE YEAR AGO: Oracle Corp. unified the software licensing schemes for all of its business applications into four pricing models.

Global Dispatches

Opera Files Suit Against Microsoft

BRUSSELS – Opera Software ASA last month filed an antitrust complaint against Microsoft Corp., accusing it of stifling competition by tying its Internet Explorer Web browser to Windows. The complaint, filed with the European Commission, contends that Microsoft is abusing its dominant position in the PC business.

Oslo-based Opera is asking the commission to force Microsoft to unbundle IE from Windows or to offer other browsers as a standard part of the operating system.

Microsoft said it will cooperate with any investigation that may result from Opera's complaint. It also claimed that users can now "use and set as default any browser they wish" and that "PC manufacturers can preinstall any browser as the default on any Windows machine they sell."

James Niccolai *and* **Paul Meller**, *IDG News Service*

IBM Projects $1B In India Revenue

BANGALORE, INDIA – IBM is projecting sales of about $1 billion (U.S.) from its Indian operation, up from about $700 million in 2006.

A spokesman for IBM India Ltd., which is based here, said sales in India grew by 39% during the first three quarters of 2007. "At the current growth rates, we expect revenue of $1 billion for the year," he said.

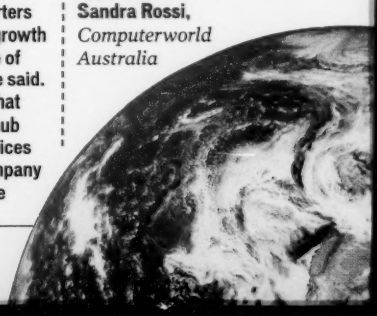
The spokesman said that India has become a key hub for IBM's delivery of services worldwide, since the company is taking advantage of the country's large pool of skilled labor. The company employed 53,000 people in India at the end of 2006. Current figures are unavailable, said IBM.

John Ribeiro, *IDG News Service*

BRIEFLY NOTED

National Foods Ltd. has extended its outsourcing contract with Hewlett-Packard Co. by three years. The deal is worth $12.3 million Australian ($10.6 million U.S.). HP manages the Melbourne, Australia-based dairy products manufacturer's IT infrastructure and is planning to introduce SAP AG applications.

Sandra Rossi, *Computerworld Australia*



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OUR VITAL SIGNS SURVEY FORECASTS

A BUSY YEAR FILLED WITH INTRICATE PROJECTS, FRESH-FACED STAFF AND A CRUSHING AMOUNT OF DATA.

ARE YOU READY?

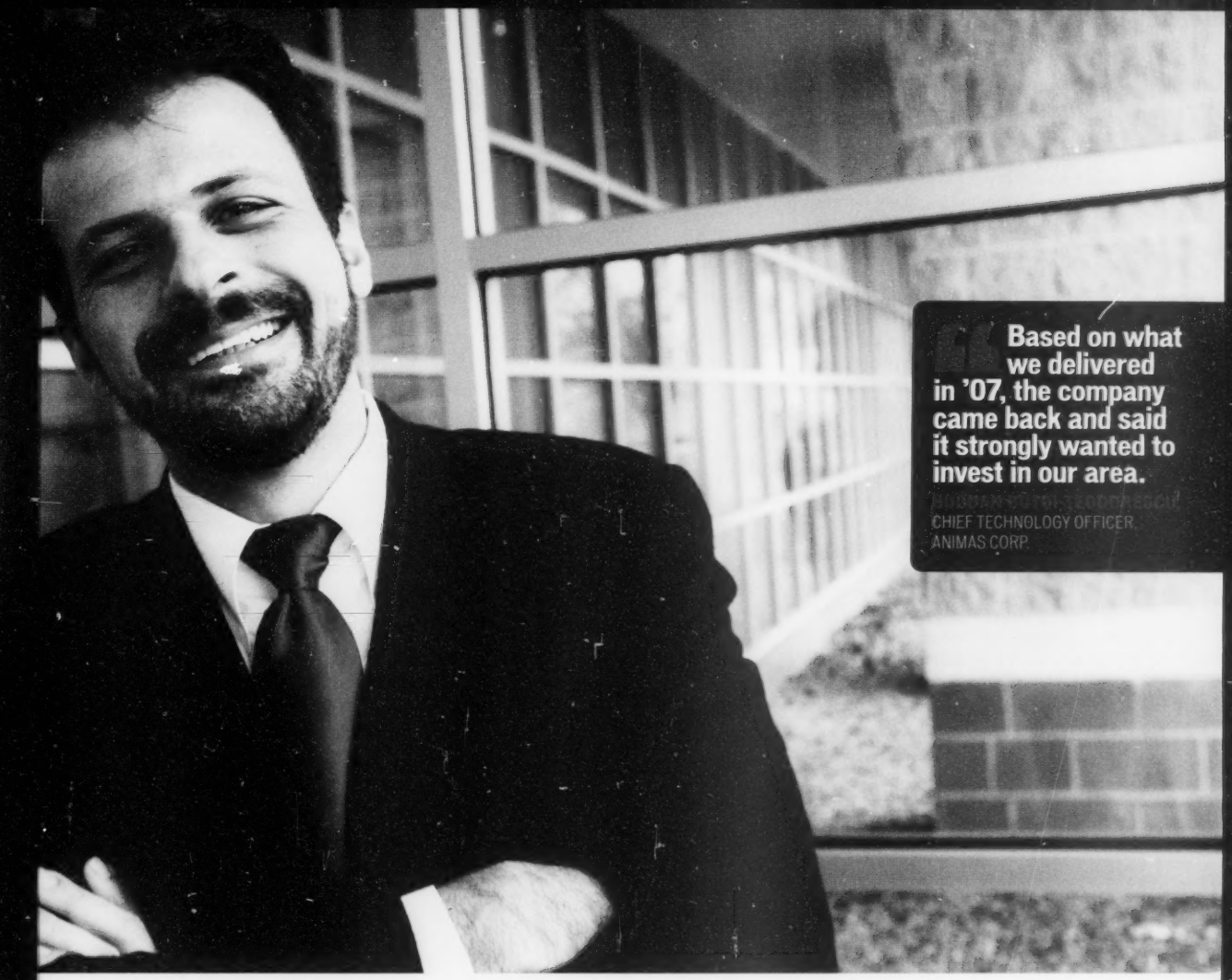
SCOTT NIBAUER

TREND NO. 1

Tightfisted Budgets Loosen a Bit

Yet the economy continues to cast a shadow of uncertainty over the best-laid tech spending plans. **BY MARY BRANDEL**

ILLUSTRATION BY RICHARD BORGE


Based on what we delivered in '07, the company came back and said it strongly wanted to invest in our area.
BOGDAN BUTOI-TEODORESCU
CHIEF TECHNOLOGY OFFICER, ANIMAS CORP.

WHEN Bogdan Butoi-Teodorescu, chief technology officer at Animas Corp., submitted his IT budget for 2008 this past summer, he requested a head-count increase of 10%, as well as a 12% budget boost. He was happy to hear that his budget numbers were approved — especially after two years of a flat IT budget — but he was both happy and surprised when the number of hires he requested was not only approved but exceeded.

"Amazingly, we got a 20% increase in head count," he says. "Based on what we delivered in '07, the company came back and said it strongly wanted to invest in our area."

Butoi-Teodorescu isn't the only IT executive with a positive budget outlook for next year, according to data collected in September 2007 via *Computerworld*'s first-half 2008 Vital Signs survey. In the survey, 47% of respondents said they expect their IT budgets to increase in 2008, with an average increase of 12.5%. Also notable, 64% of respondents said that of all their companies' business areas, IT would see the largest budget increases. Last year, a somewhat smaller percentage (41%) saw budget increases, although the average amount of each increase was higher, at 21% (see charts, next page).

While such a cheery budget outlook jibes with preliminary findings gathered in October by Gartner Inc. for its 2008 IT budget study, Gartner analyst Michael Smith predicts a turn for the worse when all the data is taken into account. In October, when about 500 of Gartner's expected 1,700 responses were in, 60% of the respondents had said IT budgets would rise in 2008, with an average increase of 4.8% to 6.4%. But, Smith points out, that was before economic indicators darkened,

specifically those related to the subprime lending crisis, which had negatively affected financial markets by late November. Combined with a sluggish housing market, rising oil prices, a weak U.S. dollar and waning consumer confidence — not to mention the predictions of a worldwide economic slowdown, if not outright recession — some of the fall's optimism was on shaky ground by year's end, Smith says.

"There are strong signs that the rate of budget increases we saw in the preliminary data will be tempered a bit," Smith says. "It shows how business-aware IT needs to be, because if something like housing sees a downturn, that affects hiring plans and IT investment strategies."

Forrester Research Inc. also sees a risk of the U.S. economy "falling out of bed," says Andrew Bartels, an analyst at the firm. In fact, he lowered his overall U.S. hardware and software spending growth estimate for 2008 from 8% in the fall to 5% in December. CIOs should plan for very small budget increases in '08, he says.

That's because the technology market goes through periods of innovation followed by digestion, Bartels says, and in 2008, companies will re-enter the innovation phase. In particular, he predicts that companies will begin to invest in service-oriented architecture, which requires renewed investment in infrastructure and applications. Software categories such as infrastructure management, databases, application servers and integration applications will see a growth rate of 8%, he says. Also popular will be business intelligence, enterprise content management, ERP, customer relationship management, supply chain management, product life-cycle management and storage resource management applications, which Bartels says will grow at rates of 8% to 9% each.

Another reason companies are looking to increase IT spending, Smith says, is that so many of them — particularly large ones — invested heavily in infrastructure in the late 1990s and then cut IT spending during the downturn of the early 2000s. Now, those investments are in need of renewal, he says.

Meanwhile, growth-oriented small and midsize companies are looking to technology to enhance their business strategies, Smith says. "There's interest in specific areas like business intelligence and enterprise information management, and a lot of that is coming from smaller companies that are growth-oriented," he says. In fact, according to Gartner's October snapshot, IT budget increases are highest among smaller companies, especially those with revenue below $500 million. The difference is even more marked among companies with revenue of $10 billion or more, mainly because of postmerger IT integration, Smith says.

EYE-OPENING PERFORMANCE

In Animas' case, increased spending was motivated by IT's performance in 2007. When the insulin-pump manufacturer was purchased by Johnson & Johnson in 2006, much of IT was outsourced, and the remaining 10 full-time staff members were senior-level people who understood both technology and the medical device market, Butoi-Teodorescu says.

Apparently, the new model is working well. Last year, the IT group worked with various Animas departments on streamlining business processes, delivering more than 20 projects that were mostly within budget, according to Butoi-Teodorescu. "And many had strong ROIs — 2007 was a good year for us," he says.

This year, armed with more people and more money, Butoi-Teodorescu plans to continue automating processes with additional departments, but much of next year's investment will be in Web commerce, he says. For instance, he plans to further refine the company's business-to-consumer Web sales capabilities in the U.S. and to initiate business-to-business Web ordering, where Animas sells through distributors.

Marvair is another organization that experienced an awakening of sorts to what IT can offer, particularly to a small business. Marvair — a $30 million division of Airxcel Inc., a privately held manufacturer in Wichita, Kan. — makes HVAC equipment for commercial and specialty applications. Over the past couple of years, business has been flat, which resulted in Marvair's bare-bones IT spending, says IT manager Mike Ramsey. But in 2006, its annual audit

Continued on page 14

>>>VITAL SIGNS<<<

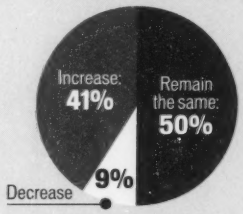
Twice a year, *Computerworld* surveys a select group of IT executives on topics such as budget plans and staffing levels. The results appear in our regular Vital Signs feature.

SMALL GROWTH

Nearly half of all respondents said they expect their 2008 IT budgets to increase, up 6% from last year's figures.

2007

What changes do you expect in your IT budget in the next 12 months?

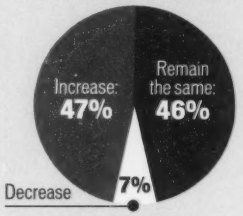


Expect budgets to **INCREASE,** by **21%** on average

Expect budgets to **DECREASE,** by **18%** on average

2008

What changes do you expect in your IT budget in the next 12 months?



Expect budgets to **INCREASE,** by **12.5%** on average

Expect budgets to **DECREASE,** by **7%** on average

SOURCES: *COMPUTERWORLD*'S FIRST-HALF 2007 VITAL SIGNS SURVEY, 252 RESPONDENTS; 2008 VITAL SIGNS SURVEY, 103 RESPONDENTS

A RAISE FOR IT

The 10 business areas that will see the biggest increases in spending in the next 12 months:

1. IT
2. Operations/facilities
3. Customer services
4. Communications
5. Marketing
6. Sales
7. Research and development
8. Human resources
9. Manufacturing
10. Finance/accounting

SOURCE: *COMPUTERWORLD*'S FIRST-HALF 2008 VITAL SIGNS SURVEY, SEPTEMBER 2007; 47 RESPONDENTS

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Continued from page 12

revealed that IT spending was well below the norm for a company of its size. "That opened a lot of eyes in higher management," he says. "They're starting to see that they have to spend in IT when the business is focused around an enterprise-size ERP system." Marvair uses an ERP system from Infor Global Solutions Inc. Right now, Ramsey says, the company isn't fully utilizing the software's capabilities, so "we're now looking at ways of getting more out of the system we have and adding to it."

It helps that within the past three years, Marvair has hired people in IT who are business-savvy and able to get more involved with the people who use the ERP system. "We see what other companies are doing and bring that back to the business managers, and slowly, the wheels begin to turn," Ramsey says.

In 2008, Marvair plans to update its aging desktop systems and network infrastructure, increasing its wireless capabilities, among other things. It will also invest in automating inventory control, adding bar-code scanning and integrating that system with its ERP software.

Emcor Facilities Services (EFS) is another company that was inspired to maximize its ERP investment. It did that by upgrading its J.D. Edwards system and integrating it with its enterprise asset management and customer support systems, according to Peter Baker, vice president of IT at EFS, a subsidiary of Emcor Group Inc., a $5 billion speciality construction and facilities management company. Because of the ERP upgrade, Baker is looking at a 2008 budget increase. But this year's increase is smaller than the one Baker got last year, which was EFS's catch-up year.

"We had quite a bit of stuff that had been languishing, so we had a lot of projects on our plate," he says. Baker also plans to enhance EFS's Web delivery tools so customers can request services and check the status of their accounts over the Web.

IT AS A GROWTH ENGINE

Other companies will see upticks in their IT budgets as a result of business expansion, either domestically or overseas. For instance, in mid-2008, Sharp Healthcare, a San Diego-based nonprofit health care organization, plans to open a new 300-bed hospital that will be what CIO William Spooner calls "as near paperless as possible, or 'paper-light.' " As a result, Spooner saw his IT budget rise for '08, following an even bigger increase in '07. The increases may continue, as the systems to make the near-paperless environment possible are rolled out to the rest of Sharp's hospitals in 2009.

That's not all Spooner will be overseeing. In Sharp's ambulatory care area, its IT organization will aggressively work to move all of its physicians online for order entry, e-prescribing, billing and document scanning. Meanwhile, other areas of the health care organization are growing. For example, it's opening a couple of new medical office buildings and undertaking smaller expansions of existing facilities. "We've got a pretty healthy appetite for expanding our facilities and implementing related infrastructure," Spooner says.

The budget increase will also help offset increased labor costs that Spooner anticipates, as a result of hiring people and paying the salaries those new hires will command. "We'll be hiring about 20 people to support the expansion of our ambulatory project, and the cost of labor is going up," he says.

Competition for talent is mounting because the health care industry is "starting to get it in terms of where we have to go with automation," he says. Another factor is a nationwide nursing shortage, which has created a smaller talent pool than health care firms are used to having.

Another organization with growth on its mind is Hilton Hotels Corp. After acquiring Hilton International in 2006, it set out to globalize its proprietary system, called OnQ, as well as accompanying support services, to work in 78 additional countries. Correspondingly, its IT budget has seen continued growth, up 32% in 2007 and 18% for 2008. "When you look at '07-'08, you'll see a continuation of that same strategy as we extend OnQ into more hotels in more countries," says Tim Harvey, CIO at Hilton, which operates more than 2,700 hotels around the world. OnQ combines CRM, revenue management, property management, back-office capabilities and business intelligence functionality into a single enterprise system.

Hilton's IT budget increases are also related to pent-up demand that grew during the hospitality industry's downturn from 2001 through 2004, Harvey says. In 2007, Hilton also started providing its own high-speed Internet access service for guest rooms. In addition, it is enhancing the scope of OnQ to include integrated sales and events features previously provided by an external vendor's system.

Despite Hilton's growth plans, Harvey says the company still remembers the lessons of budget austerity. "We have steering committees that help us prioritize what we're investing our dollars in," he says. "That leads to trust and credibility."

Smith echoes that conservative approach. Even for CIOs planning budget increases, he recommends preparing a contingency budget in case macroeconomic forces derail IT budget growth. He also warns that IT should continue to look for efficiency improvements in delivering day-to-day services.

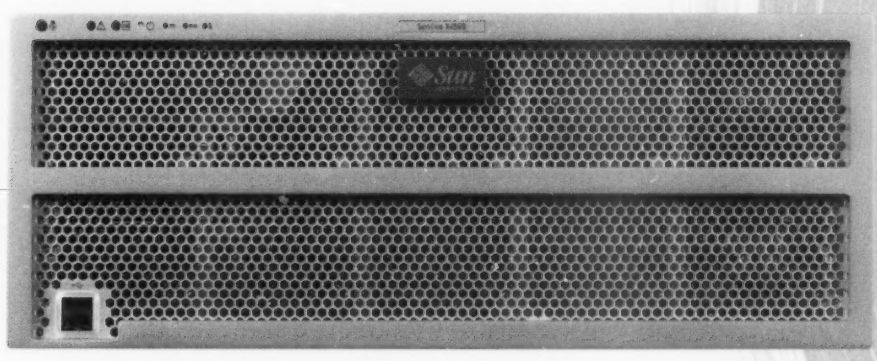
With a dubious U.S. economy, the IT budget increases forecast for 2008 are not yet a harbinger of a wholesale IT industry turnaround, Bartels agrees. The mood, he says, should be one of conservative optimism. "With overall demand generally moderate," he says, "CIOs can still expect to drive hard bargains with vendors." ■

Brandel *is a* Computerworld *contributing writer. Contact her at marybrandel@verizon.net.*

»»PREDICTION««

"The economy is slowing, yet this time around, CIOs will push back against across-the-board cuts in favor of directing spending to where it will make a difference. It will be a year of internal political strife, but real IT portfolio renovation will come out of it.

BRUCE A. STEWART, ANALYST, ACCENDOR RESEARCH INC., VANCOUVER, BRITISH COLUMBIA, AND A *COMPUTERWORLD* COLUMNIST



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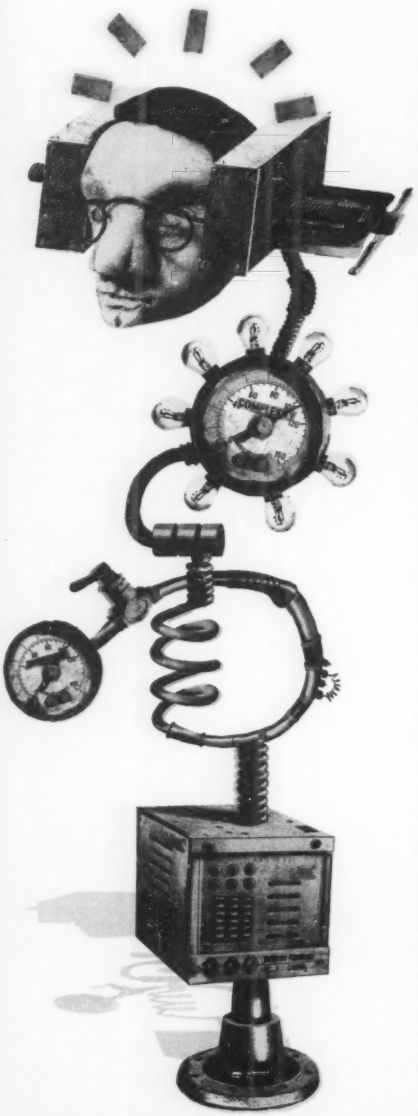
TREND NO.2

Projects Get More Troublesome



As IT moves from maintenance to more complex projects, expect bigger headaches.

BY GARY ANTHES

IT'S GOING to be a tough year for IT project managers, according to a recent *Computerworld* poll. Managing projects has always ranked high on our annual list of IT managers' worries, but it rose to the No. 1 spot in our first-half 2008 Vital Signs survey.

IT managers cite a variety of reasons for their escalating concern, including growing globalization, IT budget increases, budget decreases, an overall increase in the complexity of projects, and end users who are simply demanding more.

But the good news, a number of them say, is that they have found strategies and tactics for dealing with the age-old difficulty of bringing in projects on time and within budget while keeping end-user complaints under control.

The loosening of the IT purse strings that began a couple of years ago will continue to be a double-edged sword in 2008. "Budgets lag reality in IT," says Paul Glen, an IT management consultant and a *Computerworld* columnist. "You have a couple of bad years, and suddenly IT stops doing projects. Now we are a year or two into doing projects again, and we are suddenly realizing, 'Oh, these aren't going so well.' "

And Gopal Kapur, president of the Center for Project Management in San Ramon, Calif., says companies have pretty much picked the low-hanging IT fruit and are starting on bigger, more complex projects.

"Bigger projects carry higher risk," he points out. "The absolute complexity is higher, but the absolute skills are not higher, so the gap is large. You can't pick the higher fruit if your ladder is not strong."

John Bruggeman, IT director at Hebrew Union College–Jewish Institute of Religion in Cincinnati, has a short ladder. He might be counted among the lucky for having recently received several large gifts earmarked for IT projects, but the gifts didn't provide for the hiring of additional staffers to do the projects.

The initiatives include implementation of a large student information system (SIS), a facility renovation that includes IT infrastructure upgrades, and deployment of classroom videoconferencing across four campuses. "I've been in maintenance mode the past five years," Bruggeman says, "and to have these three big projects tossed on the plate has really created a time crunch."

When you have more money than people, look to vendors to help out, especially with project management, Bruggeman suggests. He says he received two bids for the SIS. One came from a vendor that verbally promised to manage the project but subsequently refused to put that promise into the contract. The winning vendor was willing to guarantee that it would manage the project — and didn't even charge extra for the service, he says.

DECONSTRUCTING GLOBAL PROJECTS

Increased globalization is contributing to the complexity of projects and of project management, says Mark Showers, CIO at St. Louis-based Monsanto Co. "We have finally gotten away from doing a lot of silo projects," he says. "For example, Monsanto is on a single instance of SAP, and you typically have people from all around the world working on a project."

For large projects — typically, more than $5 million — that are geographically distributed, the $8.5 billion agricultural biotechnology firm has found a project management innovation that

ILLUSTRATION BY RICHARD BORGE

Showers calls "three-headed leadership." The troika consists of a business manager from the country, acquired firm or business unit that will be the primary user of a new system; an enterprise corporate manager from Monsanto's St. Louis headquarters; and an IT manager associated with the user country, acquisition or business unit.

The arrangement brings more leadership to bear and more "ownership — more skin in the game," Showers says. He says it reflects a realization that "IT projects" are rarely only about IT anymore. "Projects rarely fail because of technology," he notes.

As CIO at Wall Homes Inc. in Arlington, Texas, Andrew Brimberry has to stretch a lean staff. He says one way to streamline internal communication and take some of the burden off of project managers at the small, recently formed home construction firm is to have programmers sit in on requirements definition meetings with end users.

"That does take time away from coding, but [when coders] understand directly from the user what the project goals are, they do a much better job," he says. "It's a sacrifice that has always paid off for us."

A deep understanding of the business is vital for IT at Wall Homes, Brimberry says, because construction managers in each major city have the right to manage their work as they see fit. For that reason, it's important for systems to be readily adaptable to changing and sometimes conflicting requirements, he says.

>>>VITAL SIGNS<<<

PROJECTS PREDICAMENT

What do you expect will be your biggest management challenge in the next 12 months?

- **Managing projects** — UP FROM NO. 3 IN 2007
- **Managing personnel**
- **Budget constraints** — DOWN FROM NO. 1 IN 2007
- **Regulatory compliance**

SOURCE: *COMPUTERWORLD*'S FIRST-HALF 2008 VITAL SIGNS SURVEY, SEPTEMBER 2007; 103 RESPONDENTS

MANAGING PROJECTS ON A BUDGET

While IT managers at companies facing robust growth in 2008 are likely to be challenged by stepped-up demand for projects, those experiencing financial uncertainty or retrenchment have a different sort of problem, says Danny Siegel, director of worldwide technology engineering at Pfizer Inc. The New York-based pharmaceutical company's sales have been flat for four years, and it has seen recent steep declines in the sales of some of its major drugs.

The problem at such times is that the business units that use IT have cut staff and are facing budget squeezes too, so they are less able to provide vital support for IT projects, Siegel says. "So the project manager goes to the customer groups and says, 'Help me define what we are trying to do,' and the customer group says, 'Thanks for asking, but we have no people.' "

Still, Pfizer has managed to sidestep a shortage in project management support by outsourcing most of its IT. What was once project management has morphed into vendor management, Siegel says. The job of internal IT managers has increasingly become one of setting standards and ensuring consistency and repeatability across projects.

"Now it's a matter of saying, 'Here are the tools, here are the platforms; go make it happen,' " Siegel says. "We have stopped managing our vendors at a project level. We have started certifying them at a vendor level, saying, 'We are going to audit you, but we are not signing statements of work that say, for example, that over the next six weeks you are going to deliver the following three things.' "

Managing IT projects has never been easy, but a company has an advantage when rigorous project management principles already pervade its operating units, as is the case at PCL Constructors Inc. in Edmonton, Alberta. The basics of budgeting, planning, scheduling, workflow tracking and cost control are ingrained in the work practices of the people constructing bridges, buildings and airports at PCL, says Brian Ranger, the company's general manager for systems and technologies.

PCL didn't always have strong IT project management, Ranger says, but the rest of the company came to demand it. "Our business [managers] used to be frustrated that they couldn't hold us accountable to schedule and budget," he says. "But over the past two years, IT has gotten the project management religion and now works with users on terms they understand. We are trying to operate like the business."

To help develop better project managers, Ranger dispatched "key lieutenants" to the Project Management Institute (PMI) to take courses that would lead to Project Management Professional certification, a step that costs about $6,000 per person. "It's expensive, but well worth it," he says.

But all IT staffers get some PMI training — at least enough to introduce project management concepts, which apply to both construction projects and IT projects, Ranger says. "I want everyone to understand these principles and how they work so they can be part of them," he explains.

But IT consultant Glen cautions against assuming that project management techniques that work in largely mechanical arenas, such as construction and manufacturing, can be readily applied to IT. "IT project management is part science and part art," he says. "But we, as engineers, have the bias that we can engineer solutions to fundamentally human problems."

Glen offers this advice to project managers: "Look for flexible minds, and beware of people who believe they know the answer." ■

>>>PREDICTION<<<

"Working in a fish bowl will be the unique project challenge of 2008. Transparency will expose every decision you make and every action you take to scrutiny. Thanks to search and blogs, you will have to work much harder to be perceived as 'knowing more' than the soon-to-be info-super-empowered user.

THORNTON MAY, INDUSTRY OBSERVER, MANAGEMENT CONSULTANT, COMMENTATOR AND *COMPUTERWORLD* COLUMNIST

TREND NO. 3

Servers

Go Front And Center

Data center projects are rising to the top of the project stack for 2008. Here's why.

BY ROBERT L. MITCHELL

GENERAL MOTORS CORP. might be globalizing its business, but in the area of servers, the automaker is thinking small. "The smallest physical-size servers have a far better cost per unit of work than the large, 32-CPU-class boxes," says Mark Hillman, GM's director of global computing centers. The former will serve as building blocks as the company moves from a project-specific, application-centric focus to a standardized server utility model.

The effort started with engineering, but "now we're moving that to the more general-purpose business applications," says Hillman. The results so far have been promising. By shifting from vertically scaled servers to commodity systems, GM reduced operating costs by 65% in its Toronto data center. That project will continue through 2008, Hillman says.

GM isn't alone in planning major server projects for the year ahead. In *Computerworld*'s most recent Vital Signs survey, servers topped the list of planned purchases for 2008, and nearly one in three respondents (32%) said that server spending represents the single biggest increase in their IT budgets (see charts at right).

IT executives cite a litany of reasons for moving server-related projects to the front burner. Consolidation is a big one. Some organizations are also preparing for new versions of key software, such as Windows Server 2008, and servers that will come preloaded with an embedded VMware hypervisor to speed the setup of virtual machines. "That's one of the biggest things we'll see," says James Staten, an analyst at Forrester Research Inc.

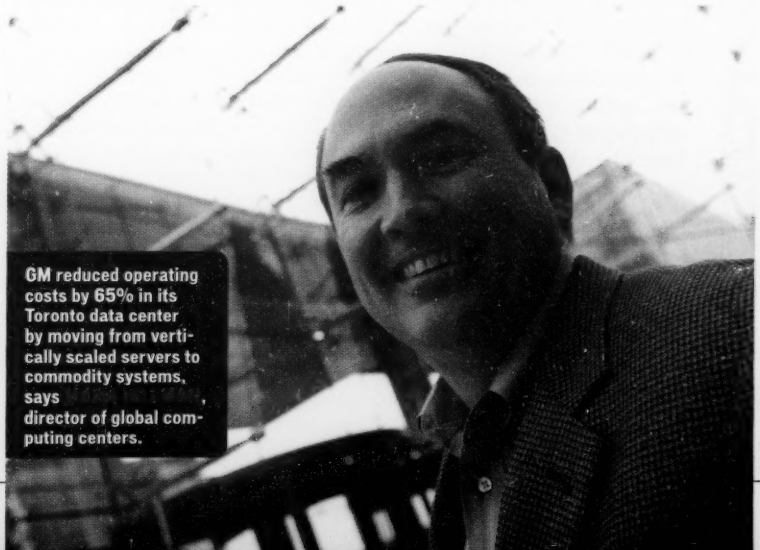
Then there are regular server refreshes. After the dot-com crash, many organizations began keeping equipment for four, five or even seven years rather than the usual three. Many of those systems are now being retired.

"Data centers today have a fairly old infrastructure. We find some very old boxes out there," says Klaus Schmelzeisen, vice president of Hewlett-Packard Co.'s consulting and integration infrastructure practice.

Compared with the Pentium 4-class and older machines still in many data centers, the latest technology performs better, takes up less space and is far more energy-efficient. New servers also use multicore processors, which are better suited for the consolidation of the many Linux and Windows applications that continue to migrate onto virtual machines.

"Forty percent of our servers are virtualized," and that consolidation will continue in 2008, says Jim Hull, group head of network and operations services for MasterCard Worldwide's global technology and operations group.

The Bank of New York Mellon Corp. also plans to "hit the virtualization space more" this year, says Dennis Smith, first vice president in the bank's IT group. Having just completed a



GM reduced operating costs by 65% in its Toronto data center by moving from vertically scaled servers to commodity systems, says , director of global computing centers.

MICHELLE ANDONIAN

merger last July, the bank is moving rapidly to establish hardware and software standards as it consolidates data centers. "We are speeding up the refresh cycle because of the need to do something quickly," Smith says.

More mission-critical applications are also migrating onto commodity servers and virtual machines. "Unix platforms were more expensive but considered to be more robust," Hull says. Not so much anymore. MasterCard is migrating more of its business-critical applications onto Linux and Windows x86-class servers, which it considers to be more secure and reliable than they once were, he says.

Competition among server vendors is also making transitions more tempting. It's a buyer's market, says Hillman. "The market is much more mature and more of a commodity than it ever was."

The big push toward using larger, scaled-up servers a few years ago has ebbed. "With cheaper, smaller boxes, migrating or replacing that [Sun E10K or IBM System p] — scaling out vs. scaling up — is the smart thing to do," Hull says. "You can do many of the same functions with six or seven smaller boxes that are a lot cheaper." That wasn't true five years ago, he says, adding, "We'll be doing more of that" type of consolidation this year.

Not every application on a midrange system is a candidate for commoditization or scaling out, but the trend is also putting downward pressure on prices for those proprietary Unix systems, says Hillman. "The commoditization of servers is affecting the more traditional Unix systems," he says. "They absolutely are coming down in price."

NEW HARDWARE NEEDS

Virtualization is also redefining server hardware itself, says Forrester's Staten. For example, IBM is seeing a surge in sales of four- and eight-processor systems, and the average revenue per machine has increased.

"[Customers] are plugging in all of the processors now, and a lot more memory than they used to," says Jay Bretzman, manager of product marketing for IBM's System x server line.

Hillman says GM's estimates of the ratio of CPUs to memory aren't holding steady. "We're finding that we need a lot more memory" to support the 10 to 20 Windows virtual machines or the four to six Linux virtual machines that GM is loading onto each physical server, he says.

Hull looks for servers that are workload-optimized. "Today you have specialty engines for scale-out and scale-up," he says. Even on mainframes, Hull says, MasterCard is migrating onto specialized processors such as the zSeries Application Assist Processor for running Java. MasterCard isn't alone: Many businesses are asking to see benchmarks of performance under specific workloads, says Rakesh Kumar, an analyst at Gartner Inc.

Smith says Bank of New York Mellon will continue to consolidate using virtualization but is also "looking hard" at expanding its use of blade servers to allow more rapid provisioning of physical severs. Of his top 10 projects for the coming year, Smith says that "three or four" involve servers.

To a lesser extent, energy efficiency is also driving server purchasing decisions. "Our watts per square foot are four or five times what they were a few years back," and the cost of power has become "very significant" for engineering applications, says Hillman. For data centers that can't bring in more power, virtualization is delivering power savings. An application running on an old 400-watt server can be consolidated onto a physical server that may consume half the power, and that application could use just 10% of the new machine's resources if it runs within a virtual machine on that server, says Staten.

"Whenever we do server bake-offs, [energy efficiency] is a question that comes up," says Smith. The bank plans to have a program for data center efficiency in place early this year. Often, however, power is a secondary consideration. "We don't buy something based on its power," but it makes sense to use virtualization to cut power consumption and carbon output, Hull says.

Some organizations are using server virtualization technology for more than just consolidation. Sean Wieland, technology officer at The Henry J. Kaiser Family Foundation, plans to use virtualization this year for business continuity.

Wieland says that his organization plans to replicate virtual machine instances of Exchange Server, SharePoint, SQL Server and other key applications in its Menlo Park, Calif., and Washington offices and mirror the data between sites in "almost real time." The nonprofit expects to install new, redundant servers in both locations that will allow full recovery within minutes of a failure. "That's better than being a couple of days off," says Wieland, referring to the performance of his current tape backup systems.

Despite the advances, IT executives say there's one thing that's still missing: mature cross-platform management tools. "I would like the ability to manage multiple platforms via a single tool that allows me to see the whole environment versus islands of servers," says Hull. "That's pretty important if you have thousands of servers."

Smith sees consolidating server infrastructures as a precursor to full-blown utility computing. "You're starting to see capabilities that have existed in the mainframe world for years," he says. But those services — in areas such as priority queuing, resource management and security — still aren't mature, says Hull. His advice to server vendors in 2008: "Get more mainframelike." ■

>>>VITAL SIGNS<<<

SERVING UP SERVERS

The top five IT project priorities for 2008:

1. Server-related projects
2. Storage
3. Security
4. Data management
5. Disaster recovery/continuity planning

BASE: 103 RESPONDENTS

WHERE THE MONEY GOES

Respondents who expect an increase in their 2008 IT budgets said these technology areas will see the biggest spending increases:

1. Servers
2. Storage-area networks
3. Disaster recovery/continuity planning
4. Networking equipment
5. Network-attached storage

BASE: 47 RESPONDENTS

SOURCE: *COMPUTERWORLD*'S FIRST-HALF 2008 VITAL SIGNS SURVEY: SEPTEMBER 2007

ILLUSTRATION BY RICHARD BORGE

TREND NO.4

Storage Projects

Rise in Importance

IT executives clamor for ways to prune and centralize their mushrooming data stores.

BY JENNIFER McADAMS

IN 2008, almost every sector will continue the battle with data overload. Entertainment powerhouses — from television stations to big-name amusement parks — will struggle to house huge media files or to manage the data necessary to track customer spending trends. Universities will need extra capacity to spur e-learning and to hold more detailed data on students. Hospitals will cling to enhanced storage projects to avoid buckling under onerous regulations and the prospect of storing massive image files.

These are just a smattering of scenarios that point to a now-staggering need for space. In fact, respondents to *Computerworld*'s most recent Vital Signs survey ranked storage-related initiatives as their No. 2 project priority this year, up from No. 4 last year.

According to Milford, Mass.-based analyst firm Enterprise Strategy Group Inc., private-sector archive capacity will hit an eye-popping 27,000 petabytes by 2010. Skyrocketing rates of e-mail growth account for much of this figure. For instance, the University of Pittsburgh now pegs monthly e-mail traffic at more than 30 million messages, vs. 17 million just one year ago.

Other new factors driving the need for capacity include the pervasiveness of large files, be they media-rich elements or specialized program data such as the computer-aided design drawings now used in building everything from cars to furniture. Cloned copies of the same information are also bogging down many corporate networks. Ironically, the adoption of virtualization technology — billed as a way to centralize and simplify storage strategies — can also trigger an initial spike in data capacity demands.

TRIM THE FAT

To combat spiraling data overload, corporate IT leaders will scour the market for ways to centralize storage and they will pursue options such as clustered architectures and unified storage-area networks (SAN). Data-pruning techniques, including the use of thin provisioning and data de-duplication tools, will also be high on 2008 corporate storage wish lists, according to Forrester Research Inc. analyst Andrew Reichman.

Mounting interest in these approaches highlights a pronounced shift away from "big-iron storage" — traditional storage arrays typically composed of custom application-specific integrated circuits, RAID controllers, and fixed-disk and cache-scalability ceilings. "The alternative is software-focused solutions that make more use of general-purpose hardware and advanced software," Reichman says.

In terms of specifics, he points to redoubled interest in software from vendors such as Network Appliance Inc., which threads a common operating system across product lines to facilitate storage at the software level. He also predicts that vendors offering building-block clustered software — such as Compellent Technologies Inc., LeftHand Networks Inc., Isilon Systems Inc. and EqualLogic Inc. — will enjoy more success in 2008

ILLUSTRATION BY RICHARD BORGE

as they rush to accommodate the shift in storage challenges facing many companies.

"What is interesting now is the fact that there are so many different types of data files and that they vary so much in size," Reichman says. "Many of these files are associated with less mission-critical applications and are therefore not structured in the way that database files are. They are also scattered across departments. Many companies are now using tools to begin saving files centrally rather than having them floating around."

GET IT TOGETHER

Indeed, IT executives from a variety of sectors agree that there's a need for storage centralization. Before pushing in that direction, the University of Pittsburgh had little control over capacity gobbled up by course management applications and scattered data warehouses. "A decision was made to implement a new, centralized storage management solution and to move away from discrete storage for specific initiatives," says Jinx Walton, the school's director of computing services and systems development.

The university settled on an IBM storage infrastructure that will afford the institution 350TB of capacity and more flexibility through life-cycle management. "The centralized storage solution provides the ability to effectively allocate and remove storage to meet the needs of specific projects," Walton says.

Amusement park giant Six Flags Inc. also had no interest in maintaining a decentralized storage infrastructure. "We have re-engineered our environment over the past year and a half and have moved to a central storage farm at each facility, as opposed to having DAS [direct-attached storage] in each server," says Michael Israel, Six Flags' senior vice president of information services. Israel also highlights his organization's rollout of a centralized e-mail platform, which doubles as a way to improve data replication and disaster recovery capabilities.

Six Flags had to examine storage issues surrounding a major new business intelligence push as well. "Providing internal users with marketing data related to sales trends, season pass holder information and inventory analysis are just three areas where we have required an increase in online storage," Israel says. Each of the company's 26 theme parks now maintains independent systems composed of HP ProLiant DL360 servers outfitted with NetApp FAS3030 storage systems. Data protection is centralized, since Six Flags' corporate data center houses NetApp SnapMirror software.

>>>PREDICTION<<<

"If 2007 was the year of encrypting laptops, 2008 will be the year of encrypting USB flash drives."

JAY CLINE, PRESIDENT, MINNESOTA PRIVACY CONSULTANTS, AND A *COMPUTERWORLD.COM* COLUMNIST

Centralization also makes sense on a security level, according to Robert Gray, founder of market research and consulting firm RobertGrayDirect LLC in Newton, Mass. "2008 will see an expanding market as fear and security concerns converge, solution-level products abound and wire-speed performance come together," he notes.

In the health care industry, security concerns are naturally paramount.

"Information must have high availability and remain safe from evildoers," says Mark Boggs, IT director at Thomas Memorial Hospital in South Charleston, W.Va. To address these concerns, the facility is continuing to build out its SAN and will soon add a peer storage architecture, which packs thin-provisioning capabilities to help accommodate huge imaging files. For its storage architecture, Thomas Memorial tapped EqualLogic, which is being acquired by Dell Inc.

Other industries are also swimming in storage-hungry data. Capitol Broadcasting Co. (CBC), a Raleigh, N.C.-based operator of five TV stations and several radio assets, is grappling with a 120% growth in e-mail volume and a wealth of media-rich graphics, audio and video files that reside on its networks.

"While e-mail archiving was the catalyst to move beyond DAS, other looming IT challenges were also driving the need for more robust storage," explains Chris Welty, a CBC systems engineer. The company is moving to IBM's BladeCenter architecture and has purchased an IP SAN from StoneFly Inc. in Hayward, Calif., in a further effort to provide single-instance storage on file servers, Welty says.

VIRTUAL STORAGE REALITIES

Because virtualization vendors, including VMware Inc., position virtualization as a way to jump-start centralization, in 2008 the technology will become more affordable and more pervasive. Virtualization often involves moving physical data to a central site and providing pointers or maps to the application in which the data is used. "We expect virtualization technologies — including but not limited to VMware — to be hot in 2008," said Enterprise Strategy Group analyst Heidi Biggar.

However, virtualization does have its issues, especially in the early stages of adoption, says Brian Matthews, computer user service specialist at the University of Texas. "Our storage demands initially increased because of virtualization," he says. "It becomes a matter of rethinking storage when virtualization is involved. Unified storage has always been the goal, and virtualization helps dramatically in this goal, but it does so at a very fast pace."

Naturally, virtualization offers short-term benefits as well. One of those relates to the technology's role in the new push for "green," or environmentally friendly, computing strategies. "Technologies such as server virtualization reduce the power and cooling footprint of the server infrastructure," says Nik Simpson, an analyst at Burton Group in Midvale, Utah.

Overall, it will be practical, incremental moves, such as cutting power consumption and emphasizing centralization, that will emerge as the biggest storage trends in 2008. More than anything, in the new year IT executives will show fortitude in the face of storage challenges and a willingness to try out the products that vendors have been hawking for a while. ■

McAdams *is a freelance writer in Vienna, Va. Contact her at JMTechWriter@aol.com.*

TREND NO.5

Face-off: Virtualization Takes Center Stage

Our columnists agree that virtual machines could make your life easier this year. But sparks fly when they talk about how.

Virtual Stride

BY FRANK HAYES

OK, MARK, I'll say it: 2008 is the Year of Virtualization.

True, *Computerworld*'s readers say that virtualization is one of the most overhyped, underdelivering technologies in IT today. And no wonder — it's almost impossible to figure out what it is. Are we talking about virtualizing servers? Storage? Networks? Desktops? Databases? Applications? Operating systems?

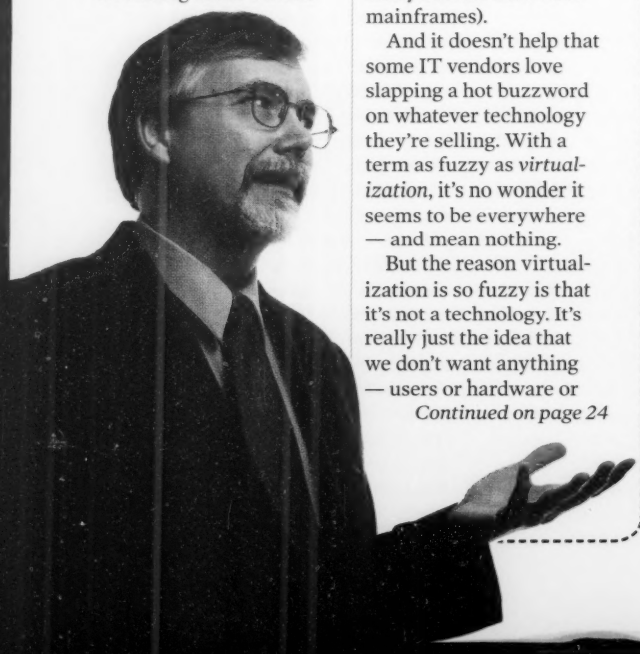
Yes.

Every one of those pieces of IT can and should be virtualized. But they're all virtualized differently. As a result, "virtualization" has the meaningless-buzzword appeal that used to belong to "object-oriented" and "downsizing" (which can still mean either moving applications off mainframes and onto smaller servers, or consolidating applications from many servers onto a few mainframes).

And it doesn't help that some IT vendors love slapping a hot buzzword on whatever technology they're selling. With a term as fuzzy as *virtualization*, it's no wonder it seems to be everywhere — and mean nothing.

But the reason virtualization is so fuzzy is that it's not a technology. It's really just the idea that we don't want anything — users or hardware or

Continued on page 24



Virtual Sprawl

BY MARK HALL

THE YEAR of Virtualization, like the Year of the LAN the last century, will eventually arrive, Frank, but without much fanfare and not in 2008.

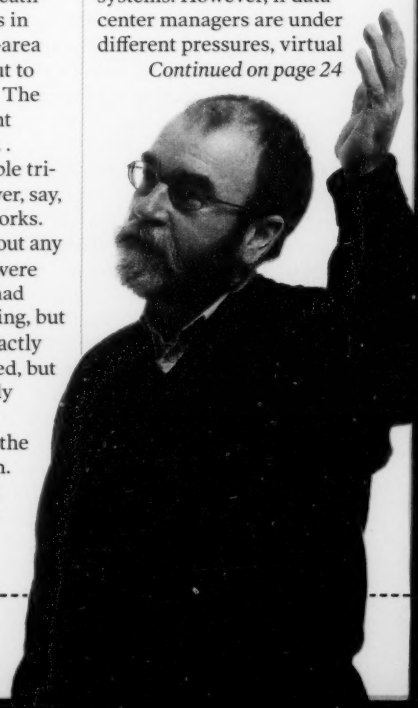
Those readers who, like the two of us, are a bit long in the tooth undoubtedly recall the annual breathless announcements in the 1980s that local-area networks were about to become ubiquitous. The years came and went — 1982, 1983, 1984 . . . — with no discernible triumph of the LAN over, say, point-to-point networks. Then, one day, without any commotion, LANs were everywhere. They had conquered networking, but no one could say exactly when. History shifted, but no one knows exactly when.

That, too, will be the fate of virtualization.

I can't argue with you, Frank, that virtualization solves many a problem today. And you cogently describe its value for companies using it now. But before our readers take your words of wisdom and join the march to virtualize their data centers, they need to take a moment to reflect on where their IT pain hurts the most.

If, as you rightly point out, a CIO's biggest issue is responding fast to business users' needs, virtualization can be an excellent tool to quickly provision and deploy server or storage systems. However, if data center managers are under different pressures, virtual

Continued on page 24



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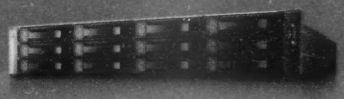

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1. Dual-Core is a new technology designed to improve performance of multithreaded software products and hardware-aware multitasking operating systems and may require appropriate operating system software for full benefit. Check with software provider to determine suitability; not all customers or software applications will necessarily benefit from use of this technology. Intel's numbering is not a measurement of higher performance. Intel, Intel logo, Intel Inside, Intel Inside logo and Intel Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. L.P. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries. ©2007 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice.

FRANK HAYES

Continued from page 22

software — connecting directly with anything else.

We want them dealing with only an abstraction — the "virtual" version of a server or memory architecture or database. That way, we can change what's behind the virtualization curtain, adding computing resources or reconfiguring server farms or redirecting storage, without having to rebuild from scratch.

We're already hip-deep in virtualization. The concept has been around for decades, and IT products that use it are nothing new. Even in the most conservative of IT shops, we deploy VPNs, operating systems with virtual memory, and relational databases with virtual rows and columns.

Then why do we call it overhyped new tech? Because it was vendors that got on the virtual bandwagon years ago, not us. They're the ones that have been moving things around behind that virtual curtain. And not all vendors — just the ones it made business sense for, like CPU and database vendors.

Now it's our turn to go virtual. Not because it's easy or convenient — when was anything in IT ever easy or convenient? — but because it's the only way we can move fast enough to do what users need.

When they need more server power for applications, we have to be able to deliver it immediately. Otherwise, they lose business.

When they need more storage, they want us to re-architect our disk farms. By the time we're done, the opportunity is gone.

When they need more flexibility or security or capability, being able to move fast is a real advantage.

That's what virtualization can deliver.

If we can figure it out.

And we'll only figure it out one piece at a time.

That's why 2008 must be the Year of Virtualization. We have to start somewhere, and this is the year to choose where — and wrap our brains around the whole virtualization idea.

Maybe that means virtualizing servers, setting them up so that instead of just one application per server, we can offer processor power by the pound.

Or maybe it will mean virtualizing storage — figuring out how we can ramp up disk space as quickly as we can link new hardware.

More likely it'll be something as simple as redirecting "My Documents" on each Windows PC to store files on a server instead of the local disk drive. That makes backups easier, improves security and gets users back up and running faster when their machines crash. It's also the kind of sweet spot that makes virtualization pay off right away as we simultaneously master the concept.

It's not much progress. But it's a first step — and 2008 is the year to take it. ■

>>>VITAL SIGNS<<<

VIRTUAL REALITY

The top five overhyped, underdelivering technologies of the past year:	The top five new technologies that hold the most promise:
1 Wireless*	1 Mobile/wireless
2 Web services	2 Virtualization
3 Vista	3 Data management
4 Virtualization	4 Storage
5 Voice over IP	5 Web services

*Including handhelds, Wi-Fi and broadband

SOURCE: *COMPUTERWORLD*'S FIRST-HALF 2008 VITAL SIGNS SURVEY, SEPTEMBER 2007; 103 RESPONDENTS

MARK HALL

Continued from page 22

machines (VM) might just make things worse.

I'm thinking about a story we published late last year about a Web hosting service that attempted to consolidate servers into a virtual environment. It turned out to be a pretty complex process that took 165,000 Web sites offline for nearly a week.

That news underscored a survey commissioned by Symantec last September about problems faced by data center managers. Two of the top four issues revealed in that study are interrelated — data center complexity and staff skills. Two-thirds of the respondents said that IT operations were becoming too complex and that there were too many applications (a trend VMs will fuel), making data center management increasingly difficult. In fact, 68% said their current staffs don't have the skills to manage the complexity of their data centers today.

And make no mistake about it, virtualization adds another layer of complexity in a data center. It may be seen as a solution to server sprawl, but VM sprawl can happen just as fast — even faster — because IT doesn't need to get a separate purchase order for hardware when adding VMs.

You'll be interested to hear that about half of the respondents to the Symantec poll said that they're trying server and storage virtualization technology. Wisely, though, precious few are using VMs on mission-critical applications. In part, that's because virtualization requires data center workers with new skills — workers who are hard to find and expensive to keep when you do find them.

Still, those who are moving down the VM road will definitely need people who understand the nuances of virtualization tools. For example, while it's simple to create a VM guest on a server to run a business application, mixing and matching VMs on a single hardware server can create a service-level agreement mess when they all start contending for I/O, sending server performance into a tailspin. Therefore, hands-on VM experience is crucial.

Virtualization is great, but each CIO needs to assess his own pain. If more of it comes from, say, managing complexity and finding good staff as opposed to dealing with server sprawl or quickly provisioning storage for an application — the Year of Virtualization may need to be pushed out for another year or two.

Ultimately, though, you're right, Frank. Just as with LANs a quarter-century ago, virtual machines will creep into our lives at a steady pace until one day we look up and see VMs everywhere, doing everything for everybody. ■

PHOTOGRAPHS BY ROBBIE MCCLARAN; ILLUSTRATION BY RICHARD BORGE

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TREND NO. 6

Hiring Ticks Up Again

As more projects get green-lighted, IT looks for adept workers to get the job done.

BY MARY K. PRATT

THE NINE-MEMBER IT staff at the National Aquarium in Baltimore already supports 350 full-time workers, 700 volunteers and 16,000 animals. They maintain business systems, admissions and ticketing software, and specialized animal care systems.

Although this IT team has been able to handle these diverse tasks so far, Chief Technology Officer Hans Keller says he needs more bodies to tackle what's ahead.

Keller's plan to add to his staff in 2008 isn't unique.

Computerworld's Vital Signs survey of IT managers shows a trend toward more hiring. Some 39% of those surveyed said they expect to increase their head count this year, up from the 33% who planned to hire last year. The latest survey also found that 56% expect no change in their IT staff size in 2008, and only 5% expect a decrease (see charts on next page).

"We're seeing more demand for workers as companies roll out more and more technology, and the environment is competitive for those with really good skill sets," says Katherine Spencer Lee, executive director of Robert Half Technology, an IT staffing firm in Menlo Park, Calif.

Robert Half Technology is already seeing the uptick. The firm's quarterly survey of 1,400 CIOs found that 12% expected to increase staff size in the last quarter of 2007. Moreover, Spencer Lee says she expects even more hiring in the year ahead based on what she's hearing from clients.

The Society for Information Management is predicting a similar trend.

>>>PREDICTION<<<

"The biggest management concern for 2008 will be finding and retaining qualified staff. Plan your training time now – you won't be able to hire people with all the technical skills and collaboration skills you will need.

JOHANNA ROTHMAN, PRESIDENT, ROTHMAN CONSULTING GROUP INC.

A recent survey of 130 CIOs and IT executives from 112 companies found that 75.4% expect to maintain or increase their IT staffs. The survey also found that attracting, developing and retaining professionals is the No. 1 concern among IT leaders.

IT managers, however, aren't just adding bodies, as they did in the frenzied hiring boom of 10 years ago. Rather, they're looking for key skills to help meet specific business goals and objectives.

"I think for the next year, we're going to see a slight increase, but I don't think we're going to have a frenzied increase; it's a more thought-out process," says Jack Harrington, president of Atlantic Associates Inc., an IT staffing firm in Boston.

Harrington says there's a need to ramp up IT departments to handle the growing number of initiatives spawned by companies that are realizing IT can help them perform better. As a result, he expects to place 20% to 25% more IT workers in 2008 than the 250 or so he placed in 2007.

David Foote, CEO and chief research officer at research firm Foote Partners LLC in New Canaan, Conn., says he too expects an uptick in IT hiring. He says companies are expanding the roles and responsibilities of IT workers, so more positions require not only technical know-how, but also strong business acumen. Workers with those two skills sets — and particularly individuals who specialize in certain business disciplines, such as marketing or finance — are in high demand.

"That kind of knowledge has really put a premium on these hybrid workers," Foote says.

IT WORKER SHUFFLE

Keller's plans for the National Aquarium's IT shop demonstrate these dynamics. One position will be a combined developer/data analyst job, which Keller says is needed to handle the "continued growth of our BI platform and the underlying reports associated with that."

In addition, as his department takes full ownership of the building operations systems, Keller says he'll move a network engineer who has been work-

ILLUSTRATION BY RICHARD BORGE

ing in the building operations area to handle the newly expanded responsibilities, and then he'll hire someone new to fill the networking engineer position.

"You'll always have network people, but those people who have ties with the business side, who understand how finance or animal management or admissions works in your organization — it's going to be extremely challenging to find people with that knowledge on the street," Keller says.

Keller's plans mirror those of other IT managers surveyed. *Computerworld*'s Vital Signs survey, for instance, found that of the IT managers who expect to add staffers, 78% are doing so for work on new systems and projects, 48% to accommodate corporate growth, 35% for security initiatives, and 20% to meet regulatory compliance demands.

Rich McClain, a managing partner at McClain Group LLC in Glen Allen, Va., says he's feeling the squeeze. His firm employs about 30 people and works with about 100 freelancers; most are senior-level IT professionals. McClain says he expects to add another 10 or so people to his staff this year.

"We could put as many people on the ground as we can recruit. And it's not just us; it's across the board," he says, noting that the evolution of core technologies as well as the development of new ones are keeping IT departments busy.

Gregory Smith, vice president and CIO at World Wildlife Fund, says he plans to increase his staff next year by about 15%, adding several new team members to his internal IT staff of 20.

Smith says he needs additional workers to respond to the growing demands of the Washington-based organization's business units. The new employees will support the group's fundraising system, its business intelligence applications and its donor management systems. He says the organization is "doing some creative things, and we have to keep up with the pace."

Smith doesn't expect to have a hard time finding the right people to fill the jobs. "Washington is technology-savvy, with a rich pool of candidates," he says.

Smith adds that World Wildlife Fund's global conservation mission is "a pretty popular draw" that helps it to attract and retain talented employees, even in a tight labor market.

Also attractive to workers are the organization's work/life balance programs, such as telecommuting, and its culture, which combines for-profit best practices with the friendly environment typical of a nonprofit.

"The right company, the right mission, the right culture in the right location will always draw a solid pool of candidates," he says. ■

Pratt *is a* Computerworld *contributing writer in Waltham, Mass. Contact her at marykpratt@verizon.net.*

IT PAY UNDER Pressure

Companies try to lure talent with a combination of cash and perks.

According to *Computerworld*'s 21st Annual Salary Survey, IT pay kicked up an average of 3.7% in 2007 and has been trending upward since 2002. The Robert Half Technology 2008 Salary Guide predicts that starting salaries will increase by an average of 5% in 2008, with larger boosts in base compensation expected for high-demand positions such as application and Web developers, network managers and database administrators.

Those increases, though bigger than in recent years, aren't harbingers of larger pay spikes ahead as firms compete for talent, says Katherine Spencer Lee, executive director of Robert Half Technology.

To be sure, companies need to offer attractive pay if they want to fill open positions, according to Spencer Lee and IT executives. But they also point out that employers and employees alike are interested in finding the right fit, which goes beyond just the highest pay.

"It is about the money, but it's not all about the money," Spencer Lee says.

Hans Keller, CTO of the National Aquarium in Baltimore, admits that he can't compete with for-profits on pay. Yet he says he's still able to recruit and retain skilled workers because he can craft an attractive total package. Keller says many workers like the organization's mission as well as some of the aquarium's unique perks, such as the opportunity to scuba dive in the tanks every other month to feed the fish.

"It's both salary and bonuses – that's a prime motivator – but it's also the corporate environment," says Jack Harrington, president of IT staffing firm Atlantic Associates.

However, organizations are going to have to rethink their pay scales, says David Foote, CEO and chief research officer at Foote Partners. Companies tie compensation to job titles, he says, even though his firm's research has found that 52% of IT workers have job titles that aren't aligned with their actual role or responsibilities.

"You need to pay them for the skills they have, not necessarily the title they have," Foote adds.

– MARY K. PRATT

>>>VITAL SIGNS<<<

HELP WANTED

More than one-third of IT executives surveyed said they will be adding staffers to their IT departments in the next 12 months:

Expect staff to **INCREASE**, by **11%** on average.

Expect staff to **DECREASE**, by **6%** on average.

PROJECTS ON DECK

What factors account for the planned increase?

New systems/projects	78%
Corporate growth	48%
Security initiatives	35%
Regulatory compliance demands	20%
Other	4%

SOURCE: *COMPUTERWORLD*'S FIRST-HALF 2008 VITAL SIGNS SURVEY, SEPTEMBER 2007; 103 RESPONDENTS

TREND NO.7

A Skills Shortage Simmers

As tech talent becomes scarce, IT managers pull out all the stops to keep workers engaged.

BY THOMAS HOFFMAN

THOUGH THE U.S. economy has remained resilient throughout the past year, it has carried both pros and cons for CIOs like Joe Trentacosta.

On the plus side, IT organizations such as that of Hughesville, Md.-based Southern Maryland Electric Cooperative Inc. (SMECO), where Trentacosta manages a 25-person staff, have increased their annual budgets steadily and added to their project portfolios. But success brings its own challenges. For example, SMECO has added three financial and human resources modules to its Lawson Software suite over the past three years, and it's taking longer for Trentacosta to find Lawson software experts in the tightening IT labor market.

After conducting an exhaustive four-month search for someone with the experience needed to customize software interfaces and reports, "I've stepped back to reassess my options," says Trentacosta.

That's sound advice for IT leaders, who will continue to encounter an ever-tightening IT labor market in 2008 (see chart, next page).

"The [IT] talent war was fought, is over, and talent won," says Michael Nieset, managing partner of executive search firm Heidrick & Struggles International Inc.'s technology practice in Cleveland. Demand for IT workers with skills in specific areas, such as Web 2.0 technologies, is driving employers to compete with one another to show that they offer the best working environment, says Nieset. As a result, those pressures are leading employers to redefine flexible working conditions.

"The idea of [having to work in] headquarters is dissolving," says Nieset. Indeed, expectations among IT executives that IT workers will put in long hours at the office are "pretty much gone," says Robert Rosen, immediate past president of Share, an IBM user group, and CIO of the National Institute of Arthritis and Musculoskeletal and Skin Diseases in Bethesda, Md.

Strong demand for IT labor should continue unabated through the U.S. presidential election, says Dan Reynolds, CEO of The Brokers Group LLC, a staffing firm in Princeton, N.J. After that, he says, other economic forces may dampen IT labor demand, including repercussions from the weak U.S. dollar and fallout from the frail housing market.

"I'm looking optimistic [about IT labor demand] for the next six to 12 months, but then pessimistic going into 2009, 2010," says Reynolds.

NEW MANTRA: RECRUIT AND RETAIN

But for the short term, at least, CIOs and other hiring managers will continue to struggle to recruit and retain IT workers. Plus, the demand for IT talent will place upward pressure on salaries across the board — not only for technologists with highly coveted technical skills such as J2EE and .Net expertise, but also for incumbent and entry-level IT workers, says Tom Casey, senior vice president and architect of the workforce transformation practice at

>>>PREDICTION<<<

"2008 will be a 'come to Jesus' year for IT workers who hold job titles that aren't consistent with what they actually do on the job. These mismatched professionals tend to be paid below market levels, and recruiters will brutally exploit this weakness unless IT moves aggressively to retitle or pay premiums for hot IT and business skills to bring pay to true market levels.

DAVID FOOTE, CEO AND CHIEF RESEARCH OFFICER, FOOTE PARTNERS LLC

ILLUSTRATION BY RICHARD BORGE

>>>VITAL SIGNS<<<

SKILLS CRUNCH

The jobs that IT hiring managers say will be most difficult to fill in 2008, because of a lack of workers with that particular skill:

1. Data management experts
2. Software developers
3. IT security workers
4. Project managers
5. Network managers
6. Help desk staffers
7. Storage administrators

SOURCE: *COMPUTERWORLD'S* FIRST-HALF 2008 VITAL SIGNS SURVEY, SEPTEMBER 2007; 103 RESPONDENTS

IT consultancy BSG Concours in Kingwood, Texas.

To help retain and engage coveted IT workers, some IT leaders are beginning to try tactics such as allowing technologists to apply for sabbaticals or devote 10% to 20% of their workdays to developing a new skill or pursuing a technology or business discipline that interests them, says Rosen. "One person I know spent six months helping a university build a whole new IT curriculum," he says.

Cross-training is another way to keep people engaged, and not just in smaller IT organizations where resource constraints come into play. Sabre Holdings Corp. moves people across disciplines within projects and also has them work with different business units, says Sara Garrison, senior vice president of product and solutions development at the air-travel software company.

Cross-training "is really, really critical" for retention, says Garrison, who oversees a group of 1,200 to 1,400 developers at Southlake, Texas-based Sabre.

Since the talent pool for certain IT skills remains shallow, hiring managers should also consider casting a wider net. For instance, earlier this year, U.S. Bancorp in St. Paul, Minn., hired a client/server application support technician who had been out of the IT field for a few years and had previously worked as a manager at a tire store.

"We know that he's going to stay with something that's broken until it's fixed," says Joel Reiter, an application analyst at the bank. "His technical skills are excellent, and he knew what it was like to work with customers." ■

8 HOTTEST SKILLS FOR '08

No one is mistaking the current IT job market for the one that existed during the dot-com days. But even though the U.S. economy is wrestling with a weak housing market and record oil prices, demand for IT workers is on the rise.

"There is a distinct shortage of certain IT [skills], and that shortage seems to be growing," says Neill Hopkins, vice president of skills development at The Computing Technology Industry Association Inc. in Oakbrook Terrace, Ill. Here are the top eight skills for 2008, as identified in our Vital Signs survey.

1 Programming/application development. As companies continue to Web-enable existing applications and plow deeper into Web 2.0, demand is red-hot for people with AJAX, .Net and PHP skills, says Katherine Spencer Lee, executive director of Robert Half Technology in Menlo Park, Calif.

2 Project management. CIOs are hungry for project managers with experience overseeing complex efforts that have delivered clear business benefits – not just people with a Project Management Professional certification, says David Van De Voort, principal consultant at Mercer LLC in Chicago.

Many organizations, such as Sabre Holdings, are applying agile development techniques. Finding people with finely honed skills in this area "is extremely important," says Sara Garrison, senior vice president of product and solutions development at Sabre.

3 Help desk/technical support. Do the math: As companies add to their application portfolios, more experts will be needed to support those systems. And much of that expertise will need to be on-premises, while only a fraction of the work is being shifted to overseas call centers. Demand for support staffers will remain strong as commercial applications continue to become more complex, notes Hopkins. "You'll need higher-skilled workers not only to implement, but [also] to manage these systems," he says.

4 Security. There will always be a need for IT professionals with core security credentials, such as intrusion-detection capabilities and government security clearances, but database and wireless security projects will drive that demand even higher this year.

Thanks to the Sarbanes-Oxley Act of 2002, "there has to be a way to control security on databases and networks to a level that we've never had to lock it down before," says Joel Reiter, an application analyst at U.S. Bancorp.

5 Data centers. There has been a flurry of activity among companies and government agencies around upgrading or relocating data centers to take advantage of virtualization and other data automation and efficiency opportunities. Meanwhile, demand for database management experts is growing "simply because organizations are putting a heck of a lot more of their business [data] on these very large databases," says Hopkins.

6 Business knowledge. Demand remains strong for people with business acumen, whether they're specialized business analysts or application developers, or other technicians with business-specific knowledge. "It's not impossible for us to find a technical person, but it is more difficult to find someone who can be a [technical] jack-of-all-trades with the business acumen to be a combination business analyst/systems analyst," says Frank Hood, CIO at sandwich chain operator The Quiznos Master LLC in Denver. "It's hard to find that total package of skill sets."

7&8 Networking and telecommunications. All sorts of networking skills are hot right now as organizations collapse their voice and data networks with wireless and voice-over-IP technologies, says Van De Voort. There's also huge demand for people with wireless know-how, particularly those with security skills, as a growing number of organizations try to build secure mobile applications, says Garrison.

– THOMAS HOFFMAN

TREND NO.8

Google Speeds Up Expansion

But where will it go next? Insiders offer their eight boldest predictions on Google's next moves.

BY STACY COLLETT

THERE'S LITTLE doubt that Google Inc. is indeed king of online media. In August 2007 alone, Google captured 57% of worldwide market share among search engines, with more than 37 billion search inquiries, according to analyst firm comScore Inc. in Reston, Va. Add to that a mind-boggling stock price of $711 per share on Nov. 5. Not surprisingly, this dominance has led to endless rumors about where Google is headed next.

Dozens of blogs feed the rumor mill daily, and speculation about Google's next move ranges from stories of an undersea cable to Asia to talk about the upcoming gPhone, new data centers and a Google virtual world.

Only Google knows for sure — but Google watchers have their own educated guesses on the company's next business maneuver. They're going out on a limb with some bold predictions for 2008 and beyond.

1 'YOU'RE WATCHING ABC GOOGLE'

In its quest for more advertising revenue, the company might acquire more-traditional media properties.

"They'll move into radio and television at some point," says Rob Enderle, principle analyst at Enderle Group in San Jose. And if that happens, media buyers would take their advertising dollars to Google first to leverage its multimedia offerings. "I'm not yet convinced that they'll buy a network," Enderle adds, "but that's a possibility" — as is the purchase of a group of radio stations that Google could aggressively shift to an online delivery model that could enhance the value of its advertising package. At the very least, he says, Google will partner with media outlets for exclusive relationships to secure its revenue stream.

"Their end goal, if they're successful, is to become bigger and more powerful than the combination of Microsoft, IBM and AT&T in their heyday," Enderle says. "And they actually have a strategy that could do it . . . by either taking the [ad] money or trivializing the contributions by the other companies."

2 GET YOUR FREE GOOGLE PC

In 2008 and beyond, most of the hardware and services that we now pay for are going to be available from Google for free — or at drastically reduced prices, says Chris Winfield, president of 10e20 LLC, a global search marketing company based in New York. Cell phones, wireless Internet access and even laptops will all be completely ad-supported. "A lot of people would gladly take a free laptop [in return for watching] some ads every now and then," he adds.

Google has already started down this path. It bought Urchin Web analytics software in March 2005 and then offered portions of it for free to users as Google Analytics. It also rebranded Keyhole 3-D satellite imagery as Google Earth and offered it up for free.

"They do that to get more control and more eyeballs and more people using their products," Winfield says. "It would be the same with a laptop or cell phone."

3 'COME SEE THE SOFTER SIDE OF GOOGLE'

What better way to tout a high-profile company than to advertise during a high-profile sporting event? Look for Google to run a feel-good commercial plugging its virtues during a future Super Bowl. "We might see their first entry into true advertising," says Rand Fishkin, president and CEO of SEOmoz, a search engine optimization firm in Seattle. "They have observed what Microsoft has done [in TV ads]. It can make an impact."

A commercial depicting Google as making the world a better place might help its image, Enderle suggests. "They're reaching a scale much like Microsoft did a decade ago, where people were getting very concerned about their motives and power," he says. "That's when you need an overarching brand campaign to make people more comfortable with who you are and where you're going."

Continued on page 32

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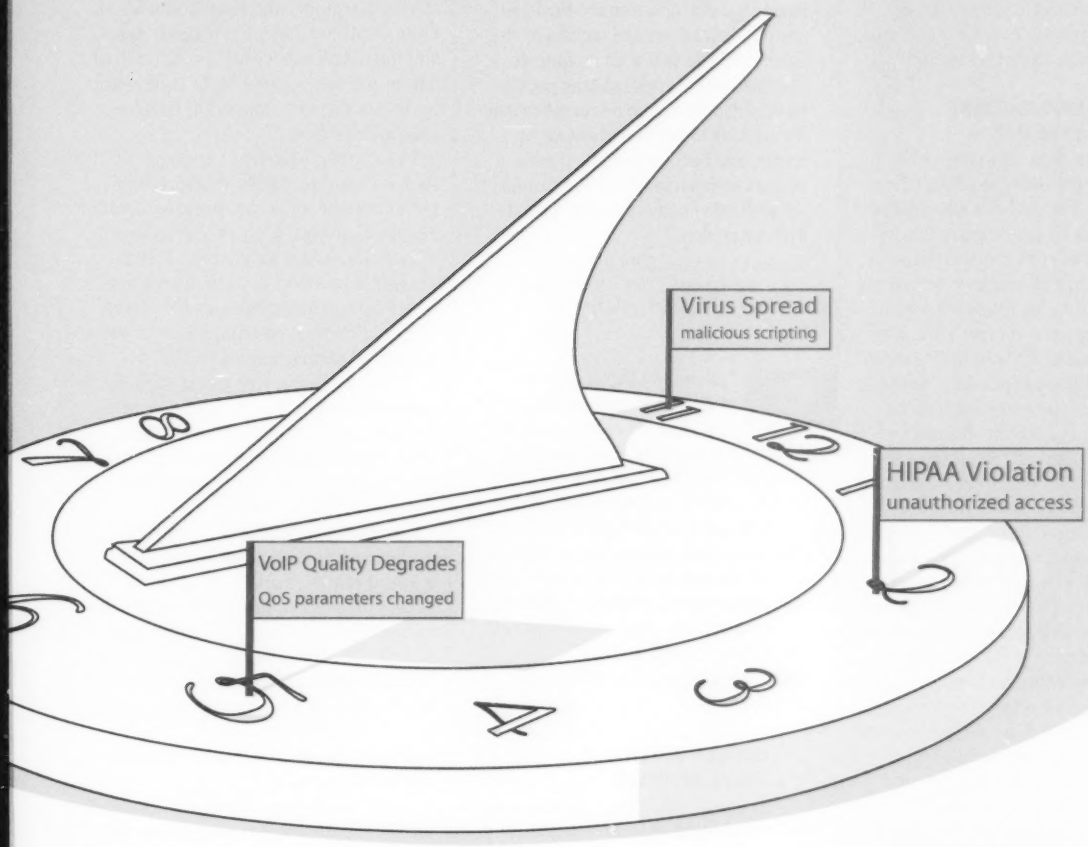

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Continued from page 30

4 GOOGLE BUYS AN AD AGENCY

A Google ad campaign might even spark a play for one of the world's best advertising agencies. "There are a lot of folks that would love to have that Budweiser ad team, Enderle says. "With the amount of money that Google's got, they could probably do it. Google is positioning itself as an überagency anyway; I wouldn't be surprised if they bought an ad agency."

5 GOOGLE APPLICATIONS FINALLY TAKE OFF

Google has had relatively little success in getting users to adopt services outside of its core search offering. Less than 5% of Google's users use its home page for anything other than search, says Peter Hershberg, managing partner at Reprise Media, a search engine marketing firm in New York. But that will change in 2008, when Google is reportedly set to launch its gPhone.

"This may be the true rationale behind the launch of mobile gPhones — which is convenience," Hershberg says. "The gPhone will undoubtedly have out-of-the-box integration with every Google application that's out there. The value in having all that information under the Google cloud in your pocket at any time may be the reason why people finally start to adopt these applications."

Users could sit in a doctor's office and pull up their medical records. Or they could use the phone to check out at a retailer rather than carrying credit cards. With Bluetooth technology, users could beam presentations and documents to desktop computers from their phones without carrying storage. They could upload mobile pictures to Picasa, Google's photo software, and blog directly to Blogger from their phones. "It will integrate all of these services together," Hershberg says.

Google's $3.1 billion acquisition of online advertising company DoubleClick Inc. will drive its application strategy even further, he adds. "When the DoubleClick acquisition closes, then they've got a real targeting layer to put on top of everything else, where they'll have demographic information, your IP address and the level of specificity where ad-targeting becomes that much more sophisticated as well."

WILL GOOGLE PURSUE A 'Second Life'?

YES **"Google will get together with The Sims and Second Life to create a new online reality game. In this game, Google Earth will provide 3-D data feeds showing buildings and topography for actual cities and regions of the Earth to create virtual environments. The Sims will provide realistic populations with different characteristics and motivations to inhabit these environments, and Second Life will provide gamers with personal avatars to interact with other gamers and participate in these worlds."**

MICHAEL HUGOS, *COMPUTERWORLD* COLUMNIST, MENTOR AND CIO AT LARGE, CENTER FOR SYSTEMS INNOVATION

NO **"[Second Life] doesn't fit well with the things they like to do. They're definitely not game developers, and they failed miserably with their social networking portal." But it's not impossible. "Engineers all get their 20% [of R&D] time. Maybe somebody had a whole lot of fun with it and just got passionate and got more people involved in it. But as far as spending a whole lot of money to develop it – I question that."**

RAND FISHKIN, PRESIDENT AND CEO, SEOMOZ

6 GOOGLE OFFERS LOCAL REVIEWS

Some 63% of U.S. Internet users performed local searches online in July 2006, up 43% from a year earlier, according to a comScore study. With local content growing in popularity, "I think [Google] will get into local reviews," Fishkin says.

"Google is one of the weakest when it comes to having content around local search and user reviews," he says. Given the popularity of local services from Yahoo, Yelp and Citysearch, Fishkin says he expects the company to invest in or partner with a local review provider or a large travel portal. "Google is going to want to serve more and complete data to users with their searches," he predicts.

7 GOOGLE TAKES ANOTHER STAB AT SOCIAL NETWORKING

Google tanked in the U.S. with its Orkut social network, though the network is widely popular in Brazil and India. Look for Google to take another, bolder run at this important market in 2008.

"Right now, they don't have any real strong presence, and they know it's the Holy Grail for them," Winfield says. "A site like Facebook controls so much of users' activities, just like Google wants to do. So it's very important to have a foothold in there."

In October, Microsoft announced that it would pay $240 million for a 1.6% stake in social networking upstart Facebook after a high-profile battle with Google and Yahoo Inc. The investment boosted Facebook's valuation to $15 billion and positions Microsoft as Google's biggest competitor in the search advertising market.

"That's why they're going to make major moves in that category — after losing that to Microsoft," Winfield says. "I see them either making a huge play [to acquire another social network] or building their own."

An internal project reportedly under way at Google encompasses a grand plan to build a social layer across all of its applications. According to TechCrunch.com co-editor Erick Schonfeld's blog, Google plans to use the feed engine that powers Google Reader (known internally as Reactor) to create "activity streams" for other applications, akin to Facebook's news and mini feeds.

With Facebook valued at $15 billion and MySpace already owned by big rival News Corp., Google will have to set its sights on smaller or foreign social networks if it wants an acquisition target, Winfield says.

8 GET READY FOR THE GOOGLE OPERATING SYSTEM

"It would not shock me if there was an announcement next year that Google was going to put into beta an operating system on Linux, an open-source system, or something like it," Fishkin says. ■

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DAVID E. CARNEY, PRINCIPAL IN THE MERGERS, ACQUISITIONS AND DIVESTITURES DIVISION, DELOITTE CONSULTING LLP

"IT will enable senior citizens to continue to live in their homes. Strategically placed monitors throughout the home will enable adult children to make sure their parents haven't fallen or had some other medical emergency. Other monitors will remind the seniors to take medicine, exercise or test blood pressure. Webcams will facilitate communications with family and friends.

BART PERKINS, MANAGING PARTNER, LEVERAGE PARTNERS INC., AND A *COMPUTERWORLD* COLUMNIST

"Research involving 1,900 employers indicates the most growth in skills pay in 2008 will be in database, applications development, security and the especially fast-growing skills group known as management, process and methodology (ITIL, business intelligence, business analysis). Experienced SAP workers will continue to top the hardest-to-hire list, but expect a surge in spending for a range of security skills as accelerating customer fears force vendors to be much more aggressive in fighting rampant data theft.

DAVID FOOTE, CEO AND CHIEF RESEARCH OFFICER, FOOTE PARTNERS LLC

"With today's high-performance blade computers, a single 8-foot-high rack can draw as much as 20 kilowatts – and take that much again for cooling. There is only one way to reduce electric costs – find a cheaper source of electricity. Today, that means hydro. So find that electric company willing to give you a break if you locate right near the source, and you might reduce your computer operation costs enough to enjoy the river view.

JERROLD M. GROCHOW, VICE PRESIDENT FOR INFORMATION SERVICES AND TECHNOLOGY, MIT

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Page number refers to page on which story begins. Company names can also be searched at computerworld.com

10e20 LLC....30
ACCURATE....6
Advanced Micro Devices Inc....2, 4
Airxcel Inc....12
Animas Corp....11
Apple Inc....6
AT&T Inc....30
Atlantic Associates Inc....26, 27
Burton Group Inc....21
CA Inc....2
California Independent System Operator....6
Capitol Broadcasting Co....21
CDW Corp....4
Center for Project Management....16
Center for Systems Innovation....32
Compellent Technologies Inc....20
comScore Inc....30
Dell Inc....21
Deloitte Consulting LLP....34
Delta Air Lines Inc....6
DoubleClick Inc....32
Election Systems & Software Inc....6
Embarq Corp....8
Emcor Facility Services....14
Emcor Group Inc....14
Enderle Group....30
Enterprise Strategy Group Inc....20
EqualLogic Inc....20
ETAI Group....8
Facebook Inc....32
FedEx Corp....4
Foote Partners LLC....26, 27, 34
Forrester Research Inc....8, 12, 18, 20
Gartner Inc....2, 11, 19, 36
General Motors Corp....18
Gold Peak Industries (North America) Inc....4
Google Inc....30, 32
Hart InterCivic Inc....6
Hebrew Union College – Jewish Institute of Religion....16
Heidrick & Struggles International Inc....28
Hewlett-Packard Co....4, 8, 18, 21
Hilton Hotels Corp....14
IBM India Ltd....8
IBM....8, 19, 21, 30
IDC....8
Infor Global Solutions Inc....14
Intel Corp....2, 4, 6
Isilon Systems Inc....20
Johns Hopkins University....6
Lawrence Berkeley National Laboratory....4
Lawson Software Inc....28
LeftHand Networks Inc....20
Leverage Partners Inc....34
Lowe's Home Centers Inc....4
MasterCard Worldwide....18
McClain Group LLC....27
Mercer LLC....29
Microsoft Corp....4, 6, 8, 30, 36
MIT....34
Monsanto Co....16
National Aquarium in Baltimore....26, 27
National Foods Ltd....8
National Institute of Arthritis and Musculoskeletal and Skin Diseases....28
Network Appliance Inc....20
News Corp....32
Nirvanix Inc....6
Opera Software ASA....8
Oracle Corp....6
PCL Constructors Inc....17
Pfizer Inc....17
Premier Election Solutions Inc....6
Project Management Institute....17
Protocol Freedom Information Foundation....6
Red Hat Inc....6
Reprise Media Inc....32
Robert Half Technology....26, 27, 29
RobertGrayDirect LLC....21
Sabre Holdings Corp....29
SAP AG....8, 16
Science Applications International Corp....6
SEOmoz....30, 32
Share....28
Sharp Healthcare....14
Six Flags Inc....21
Society for Information Management....2, 26
Solutions Inc....6
Southern Maryland Electric Cooperative Inc....28
Sprint Nextel Corp....8
Standard Performance Evaluation Corp....4
StoneFly Inc....21
Sun Microsystems Inc....19
Symantec Corp....24
Talend Inc....8
TechCrunch.com....32
The Bank of New York Mellon Corp....18
The Brokers Group LLC....28
The Computing Technology Industry Association Inc....29
The Henry J. Kaiser Family Foundation....19
The Quiznos Master LLC....29
Thomas Memorial Hospital....21
U.S. Bancorp....29
U.S. Environmental Protection Agency....4
University of Pittsburgh....20
University of Texas....21
VMware Inc....21
Wall Homes Inc....17
World Wildlife Fund....27
Yahoo Inc....32
Yelp....32

ADVERTISERS INDEX

CDW Corporation....7
CDW.com

Dell....C4
dell.com/Numberone

Diskeeper....25
www.diskeeper.com/cw2008

Hewlett-Packard Blades....1
hp.com/go/nocompromise9

Hewlett-Packard Storage....23
hp.com/go/storageutopia2

InterSystems....5
InterSystems.com/Free15A

Microsoft Unified Communication....3
microsoft.com/voip

NEC....C3
www.necus.com/hYDRAstor

Network Instruments....31
www.NetworkInstruments.com/Time

Novell....9
www.novell.com/linux

Sun Microsystems SunFire X4500....15
sun.com/opensforage

Sun Microsystems xVM....13
sun.com/xVMfreedom

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Recache Inc. seeks software engineers, DBA & System Analyst to customize applications using special tools per project requirements. Require MS/BS with 1-5yr exp. Travel required. Apply at prasade@recache.com. EOE.benefit. Travel maybe required. Apply at resume@ivsinc.net. EOE.

Emergtech Business Solutions is looking for Computer Professionals (system analyst, DBA, software engineer). Req MS/BS (equiv)+1-5yr exp. IT experience in C/C++, Oracle, SQL, VB, etc is a plus. Travel required. Send resumes to hr@emergtechinc.com. EOE

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Corporate Computer Services, Inc. (CCSI) has multiple openings for System/Programmer Analysts, S/W Engineers, DBAs using skills C/C++, VB, Oracle, etc. Minimum requirement: MS/BS+1-5yr IT exp. Travel required. Apply HR@ccsiusa.net. EOE.

Infonet Technologies seeks software engineers, system analysts/administrator and DBAs to customize applications using Java, Oracle, VB,ERP. Require MS/BS+exp. Competitive wage. Travel required. Please apply at hr@infonetllc.com. EOE.

Application & ERP Systems Developer: Perform in-house application development & report writing. Perform ERP System Administration (adding new users, security access, etc.); provide applications development support & systems integration as required; develop, document, implement & maintain ERP System policies, procedures, & standards. Bachelor's in Computer Science or a related field & 2 yrs exp. in position offered or in a related systems analysis/development or programming position. 2 yrs exp. must include experience working with a financial ERP package. Resume to Julie Slomski, HR Mgr., Logistics Plus, 1406 Peach St, Erie, PA 16501.

Senior ERP/Business Consultant (Holmdel, NJ) Business software solutions provider seeks qualified professional to analyze, design, and implement business solutions by using such skills as Microsoft Dynamics NAV, SAP B1, and supply chain management tools, and production planning and materials management expertise. Competitive salary and benefits. Contact HR Dept., Resumes@clientsfirst-us.com

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Computer Programmer. Dvlp & write s/ware prgms to address specific needs of co. Reqs 2 yrs exp in job offd or 2 yrs exp as MIS Manager, Systems Engineer, or Network Administrator. Working knowl of Compunetix h/ware messaging middleware, RTBI & access server, & 240-480-Summit Bridging Hardware, & Active Directory. Resume to ACT Resumes, ACT Teleconferencing Service, Inc, 1526 Cole Blvd, Ste 300, Golden, CO 80401.

Associate Software Developer. Dvlp s/ware on Apheresis Medical Device & for image processing algorithms using prgmg tools C & C++ for real-time operating systems (VX-Works). Reqs Masters in Electrical Engg or related field & working knowl of C, C++, VX-Works, MATLAB, & Real-Time Embedded Systems Programming. Resume to John P. Reiser, GambroBCT, 10811 W. Collins Ave, Lakewood, CO 80215.

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Texas A&M University Kingsville seeks a qualified Systems Analyst III to write programs using various languages and tools and analyze users needs. To submit resumes, please visit https://javjobs.tamuk.edu. Must put job code 0600300 on resume.

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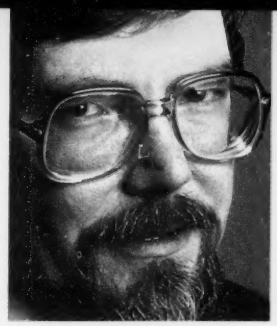
■ FRANKLY SPEAKING

Frank Hayes

Hot 8 for 2008



READY FOR 2008? Budgets may tighten up, but IT's challenges will just keep growing: security problems, virtualization technology, legal issues, users who can't be stopped and that worrisome baby-boomer brain drain. Here are eight hot-button issues to watch out for in the coming year:

■ **How far down for the economy?** A few months ago, in *Computerworld*'s latest Vital Signs survey, 47% of CIOs polled said they expected their IT budgets to rise, by an average of 12.5% in 2008. But now the bill is coming due for shaky mortgages, the dollar keeps dropping, and a business slowdown looks inevitable — Gartner puts the chance of an actual recession at 30%. Don't slash your budget plans yet, though. Ask how your CEO plans to respond, then map out how IT can help. Cutting costs is one thing, but if your company snaps up a few acquisitions, you'll need more IT budget, not less. First, you need to know the plan. Find out.

■ **It's the Year of Virtualization.** Ignore how vendors sling this buzzword around. Look at virtualization — of servers, desktops or storage — in terms of how it lets you respond faster to changes in what users need. That's where business advantage comes from, but it won't come easily, so get started. By 2010, when users need results, you'll be able to deliver them while the business opportunity is still hot.

■ **Plain text is dead.** That's your new mantra for data security. No valuable company information should go unencrypted across a wire, onto a disk or into a backup. Encryption is the ultimate defense against everything from hackers to users with USB flash drives. We've now got the CPU horsepower and the crypto technology. This year, start using it.

■ **Consumer tech hits the tipping point.** You can't keep this stuff out of the office, so stop pretending you can. Users want iPhones? Give them the Web mail and applications they need. They want to use webcams or Second Life for meetings? Track what they're doing, watch for security holes, and close them. Don't say "no," say "here's how" — or challenge users to suggest how to make their gadgets business-safe. They may surprise you.

■ Linux's next big hurdle: a billion worker-years of Windows experience.

■ **Desktop Linux? Not this year.** The functionality is now there, and so are applications and user-friendliness. But inertia is still Windows' friend. Retraining users with a billion worker-years of Windows experience is Linux's next big hurdle.

■ **Patents, patents everywhere.** And not just Microsoft's saber-rattling at Linux, or the endless patent lawsuits against IT and wireless vendors. Patent holders are now trying to control whether customers can resell equipment, who can repair it and what it can be connected to. In 2008, the U.S. Supreme Court will rule on those questions, which affect everything in IT from whether toner cartridges can be refilled to how much we can mix and match technologies. Stay tuned.

■ **Save the boomers, save the IT world?** With your baby boomer IT staffers (born 1946-1964) ready to retire, you could lose lots of critical knowledge about your business IT — right? Well, maybe. But plenty of those aging careerists sledding toward retirement just represent lots of inertia and resistance to change. Start identifying specific older IT experts worth keeping. For the rest — well, isn't it time for the next generation to step up to the challenge?

■ **It's still all about business.** Either we're technology plumbers or we're business enablers. Plumbers will get downsized, outsourced and offshored. Enablers will be critical members of the business team. That's a brutal split, but it's the IT world of 2008. Which way do you want to go? ■

Frank Hayes *is Computerworld's senior news columnist. Contact him at frank_hayes@computerworld.com.*

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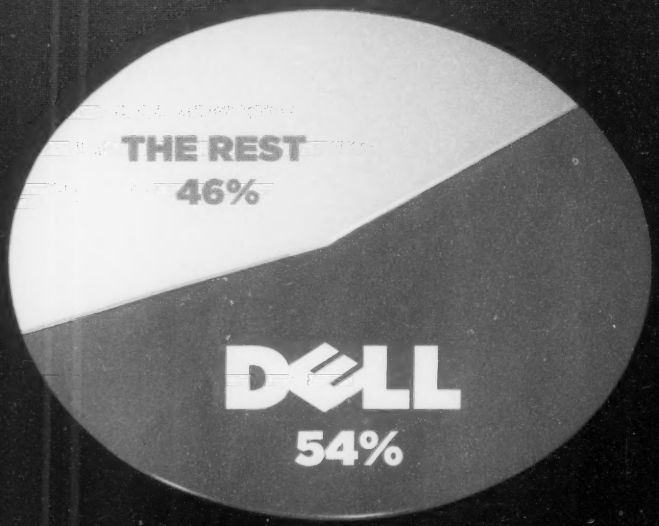

According to Forrester Research, more than half the enterprise companies in North America and Europe rely on Dell for notebook and desktop computers.
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-How Enterprise Buyers Rate Their PC Suppliers And What It Means For Future Purchases, Forrester, November 2007.

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Actual Forrester quote: "Dell is clearly the No. 1 enterprise desktop and laptop supplier." Survey question: "From which vendor did you purchase desktops in the last 12 months?" Base: 565 PC decision-makers at North American and European Enterprises.